S8212

Version 1.01

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Before you begin…

Check the box contents!

The retail motherboard package should contain the following:

S8212 motherboard

6 x SATA cable

2 x SAS cable (for S8212WGM3NR only)

USB2.0 cable

S8212 user's manual

S8212 Quick Reference guide

TYAN® driver CD

I/O shield

2 x CPU Mounting Kit

Chapter 1: Instructions

1.1 Congratulations

You have now purchased an ideal solution for your rack mount server needs. The TYAN® S8212 supports Dual AMD Opteron 2300/2400 series processors and up to 128GB REG/ECC memory. The TYAN® S8212 is configured with 3 GbE LAN ports, one IDE connector, 6 SATA-II connectors, 8 SAS connectors and 8 USB ports. The S8212 offers exceptional performance for your server platform needs.

Remember to visit TYAN®'s Website at http://www.tyan.com. There you can find information on all of TYAN®'s products including FAQs, Drivers, BIOS upgrades and much, much more..

1.2 Hardware Specifications

Processor	**Supported CPU Series**	AMD 45nm Opteron™ 2300/2400 series Quad-Core/Six-Core Processors/ Support AMD HyperTransport (HT3) Technology
	Socket Type / Q'ty	(2x) LGA 1207-pin socket
	Average CPU Power (ACP) wattage	55W / 75W / 105W
	System Bus	Quad-Core HT3 @ (17.6GB/s) 4.4GT/s Six-Core HT3 @ (19.2GB/s) 4.8GT/s
Chipset	**IOH / SB**	AMD SR5690(SR5670)/ SP5100
	Super I/O	Winbond W83627DHG-P
Memory	**Supported DIMM Qty**	(8+8) DIMM slots
	DIMM Type / Speed	Registered ECC DDR2 533/667/800
	Capacity	Up to 128GB
	Memory channel	Dual Channel
	Memory voltage	1.8V
	Note:	Supports only up to 64GB of 800MHz REG/ECC DDR2 memory (4 DIMMs per CPU)
Expansion Slots	**PCI-E**	(1) PCI-E x16 slot (w/ x16 or x8 link) (1) PCI-E x8 slot (w/ x0 or x8 link) (1) PCI-E x8 slot (w/ x4 link) (1) PCI-E x8 slot (w/ x8 link)
	Recommended TYAN® Riser	M2083-RS, PCI-E x16 1U riser card (left)
	PCI	(2) PCI 32-bit slots
Recommended Barebones /	**1U Barebones**	GT24-B8212

Chassis			
LAN	**Port Q'ty**		(3)
	Controller		Intel 82574L and 2x Intel 82575EB
Storage	**SAS**	**Connector**	(8) SAS
		Controller	LSI1068E
		Speed	3.0 Gb/s
		RAID	RAID 0/1/1E (LSI Integrated 1068e RAID)
	SATA	**Connector**	(6) SATA
		Controller	SP5100
		Speed	3.0 GB/s
		Note:	SATA CD ROM must be connected to port 5 or 6 under AHCI mode
	IDE	**Channel**	Single channel
		Controller	SP5100
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		1600x1200 @60 Hz 16bpp
	Chipset		Aspeed AST2050
Input /Output	**USB**		(8) USB2.0 ports (2 at rear, 4 via cable, 2 vertical)
	COM		(2) ports (1 at rear, 1 via cable)
	PS/2		(1) PS/2 connector
	SAS		(8) SAS connectors (for SAS SKU)
	VGA		(1) D-Sub 15-pin VGA port
	RJ-45		(3) GbE ports
	Power		EPS12V 24-pin + 8-pin + 8-pin + 4-pin power connectors
	SATA		(6) SATA-II connectors
	Front Panel		(1) 2x12-pin TYAN® front panel header (TYFP-SSI)
	IDE		(1) IDE connector
System Monitoring	**Chipset**		Winbond W83627DHG-P
	Voltage		Monitors voltage for CPU, memory, chipset & power supply
	Fan		Total (7) 4-pin headers
	Temperature		Monitors temperature for CPU & system environment
	LED		Fan fail LED indicator / Over temperature warning indicator / Fan & PSU fail LED indicator
	Others		Chassis intrusion detection / Watchdog timer support
Server Management	**Onboard Chipset**		Onboard Aspeed AST2050
	AST2050 IPMI Feature		IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash/ BIOS update / USB 2.0 virtual hub
	AST2050 iKVM Feature		24-bit high quality video compression / Dual 10/100 Mb/s MAC interfaces

BIOS	**Brand / ROM size**		AMI / 4MB
	Feature		Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE boot / ACPI 2.0 power management /Power on mode after power recovery / User-configurable H/W monitoring / Auto-configurable of hard disk types / Multiple boot options
Form Factor	**Form Factor**		EATX
	Board Dimension		12" x 13" (305mm x 330mm)
Operating System	**OS supported list**		Please refer to our web site for the OS supported list.
Regulation	**FCC (DoC)**		Class B
	CE (DoC)		Yes
Operating Environment	**Operating Temp.**		10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.		- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity		90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Complaint**		Yes
Package Contains	**Motherboard**		(1) S8212 Motherboard
	Manual		(1) User's manual / (1) Quick Ref. Guide
	Installation CD		(1) TYAN® installation CD
	I/O Shield		(1) I/O Shield
	CPU CEK / Backplate		SATA, USB
	I/O Shield		USB
	Cable	**SATA**	(6) SATA signal cables
		SAS	(2) SAS cables (SAS SKU only)
		USB	(1) USB bracket cable
Optional accessories	**Riser Card**		M2083-RS, PCI-E 1U riser card (left)

1.3 AST2050 Application

Please visit the TYAN® Web Site at **http://www.tyan.com** to download the latest AST2050 User's Guide.

Chapter 2: Board Installation

You are now ready to install your motherboard. The mounting-hole pattern of the S8212 matches the E-ATX specifications. Before continuing with installation, confirm that your chassis supports an E-ATX motherboard.

How to install our products right… the first time!

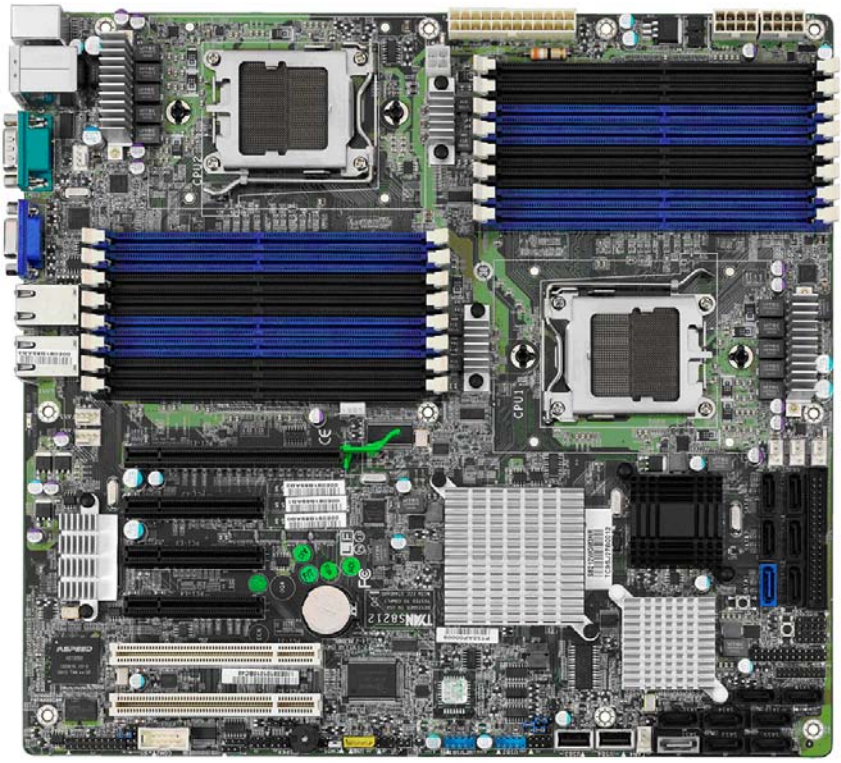
The first thing you should do is to read this user's manual. It contains important information which will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

(1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, TYAN® recommends wearing a static safety wrist strap.
(2) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
(3) Avoid touching the motherboard components, IC chips, connectors, memory modules, and leads.
(4) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
(5) Inspect the board for damage.

The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

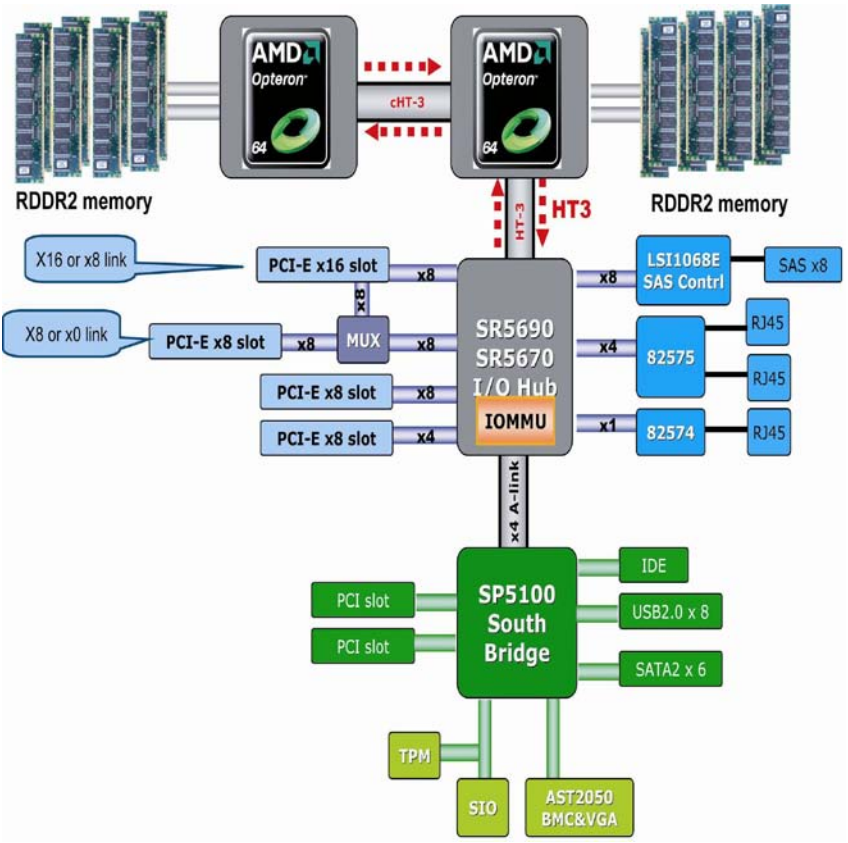
NOTE	**DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.**

2.1 Board Image

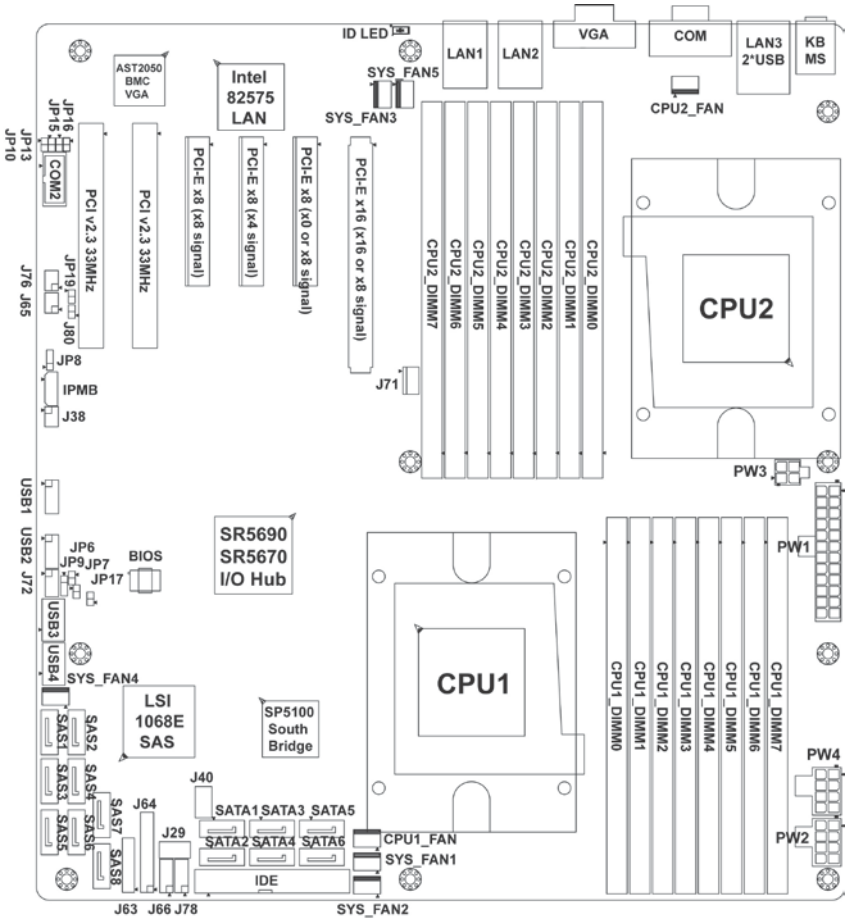


The picture above is representative of the latest board revision available at the time of publishing. The board you receive may or may not look exactly like this picture.

2.2 Block Diagram



2.3 Board Parts, Jumpers and Connectors



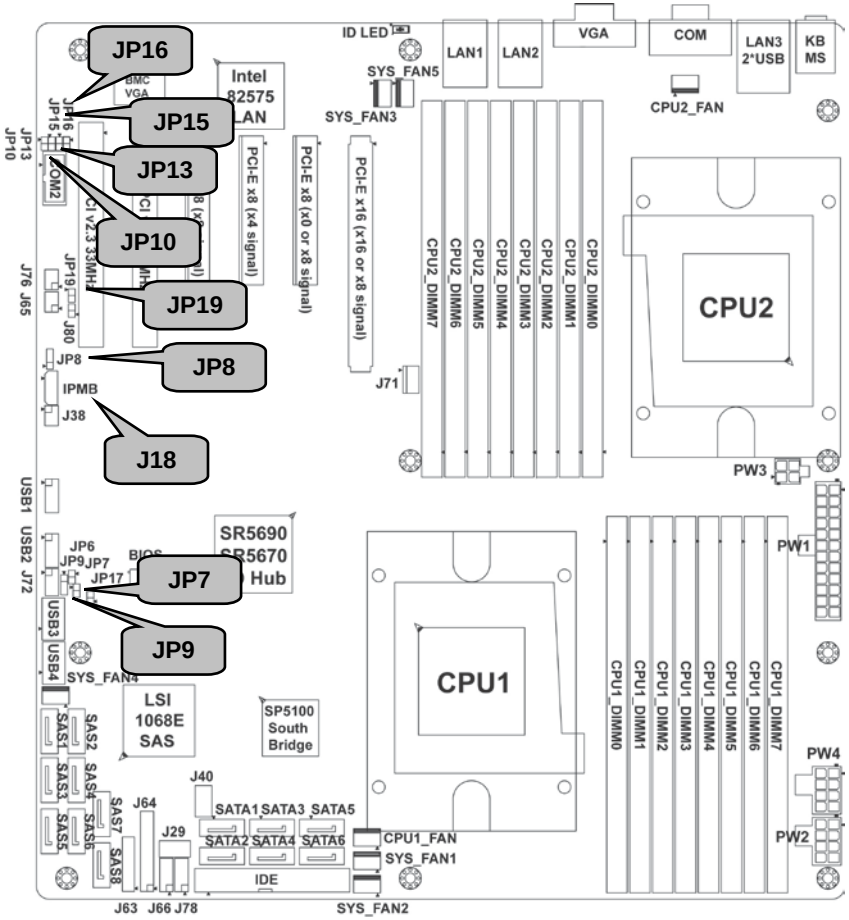
This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram. For the latest board revision, please visit our web site at **www.tyan.com**.

Jumper and Connectors

Jumper/Connector	Function
JP7	PCI-E Bandwidth Switch
J8	COM2 Connector
JP8	Clear CMOS Jumper
JP9	Onboard SAS Jumper
JP10	BMC Reset Jumper
JP13	TPM Reset Jumper
JP15	WDT Jumper
JP16	Chassis Intrusion Header
J18	IPMB Connector
JP19	Onboard VGA Jumper
J38	LCM Module Header (Barebones only)
J63	2x10-pin FAN Header (Barebones only)
J64	TYAN®-SSI Front Panel Header
J66	2x5-pin SAS FAULT LED Header (Barebones only)
J78	2x5-pin SAS GPIO Header (Barebones only)
CPU1_FAN/CPU2_FAN SYS_FAN1/SYS_FAN2 SYS_FAN3/SYS_FAN4 SYS_FAN5	4-pin FAN Header
PW1	24-pin EPS12V Power Connector
PW2/PW4	8-pin EPS12V Power Connector
PW3	4-pin Power Connector
USB1/USB2	USB Front Panel Header
USB3/USB4	Type-A Vertical USB Connector

Jumper Legend

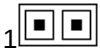
	OPEN - Jumper OFF	**Without jumper cover**
	CLOSED - Jumper ON	**With jumper cover**



JP8: Clear CMOS Jumper

3 ■ ■ 1 ■ **Normal(Default)**	Use this jumper when you forgot your system/setup password or need to clear system BIOS setting. How to clear the CMOS data - Power off system and **disconnect power supply from AC source** - Use jumper cap to close Pin_2 and 3 for several seconds to Clear CMOS - Replace jumper cap to close Pin_1 and 2 Reconnect power supply to AC source Power on system
3 ■ ■ 1 ■ **Clear**	

JP16: Chassis Intrusion Header

	**Pin**	**1**	**2**	The Chassis Intrusion Header provides chassis intrusion- monitoring function. **Note:** For use with chassis that support this feature.
	Signal	Intruder #	GND	

JP15: WDT Jumper

	Open: WDT RESET System (**Default**)
	Closed: WDT Trigger NMI

JP10: BMC Reset Jumper

	Open: Normal (**Default**)
	Closed: BMC RESET

JP13: TPM Reset Jumper

	Open: Normal (**Default**)
	Closed: TPM RESET

JP9: Onboard SAS Disable Jumper

	Open: Normal (**Default**)
	Closed: Disable onboard SAS function

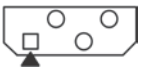
JP19: Onboard VGA Disable Jumper

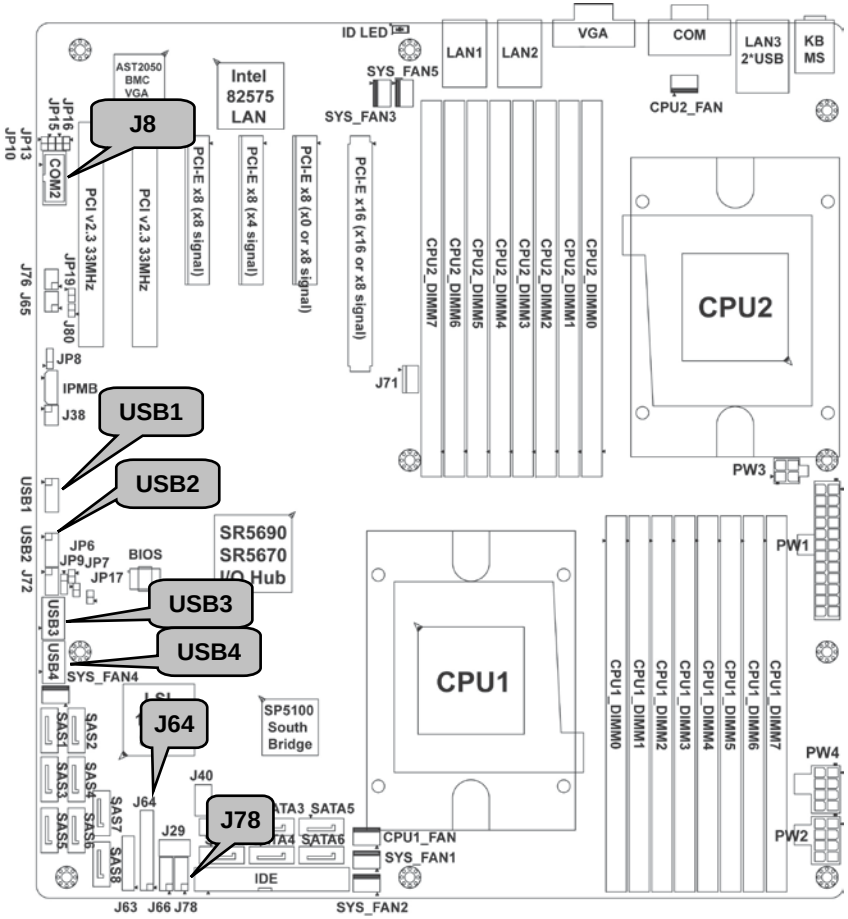
	Open: Normal (**Default**)
	Closed: Disable onboard VGA function

JP7: PCI-E Width Switch

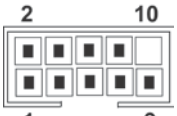
	Open: Normal (**Default**)
	Closed: Force PCI-E x16 slot to x8 mode

J18: IPMB Connector

	**Pin**	**1**	**2**	**3**	**4**
	Signal	IPMB DATA	GND	IPMB Clock	NC



J8: COM2 Connector

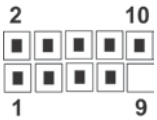


Signal	Pin	Pin	Signal
DCD	1	2	DSR
RXD	3	4	RTS
TXD	5	6	CTS
DTR	7	8	RI
GND	9	10	KEY

USB3 / USB4: Type-A Vertical USB Connector

Pin	1	2	3	4
Signal	+5V	USB D-	USB D+	GND

USB1 / USB2: USB Front Panel Header

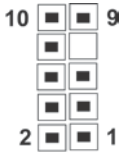


Signal	Pin	Pin	Signal
PWR_5V	1	2	PWR-5V
USB_N1	3	4	USB_N2
USB_P1	5	6	USB_P2
GND	7	8	GND
KEY	9	10	N/C

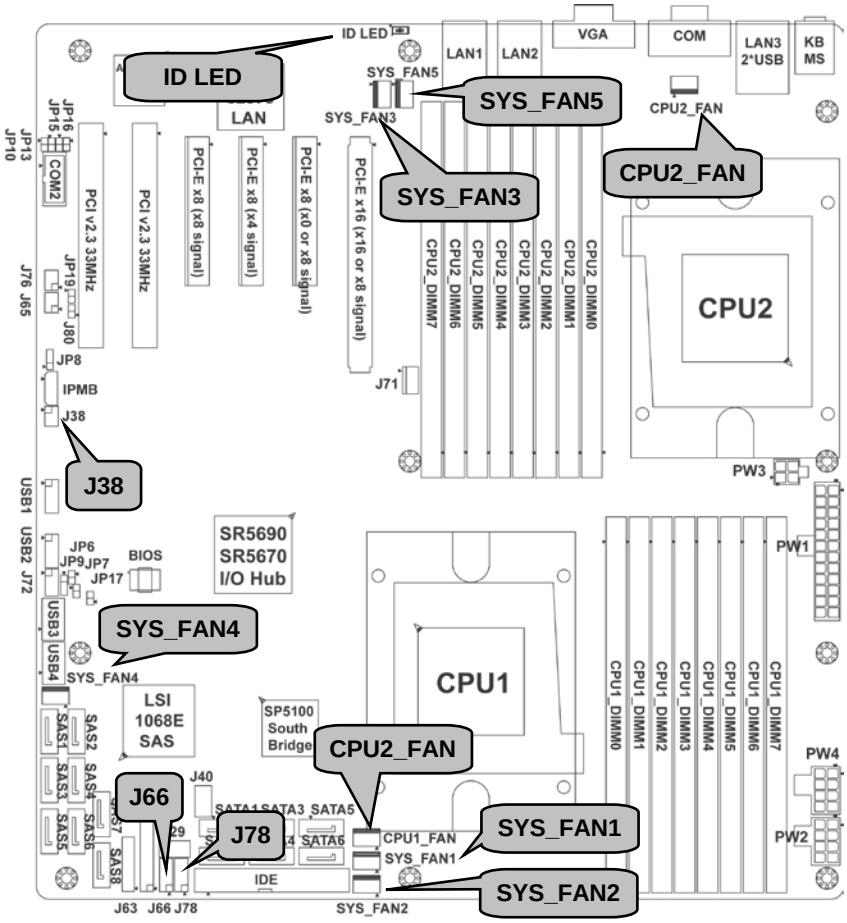
J64: TYAN®-SSI Front Panel Header

Signal	Pin	Pin	Signal
PWR LED+	1	2	+3.3V AUX
KEY	3	4	ID LED+
PWR LED-	5	6	ID LED-
HDD LED+	7	8	FAULT LED1-
HDD LED-	9	10	FAULT LED2-
PWR SW+	11	12	LAN1 ACT LED+
PWR SW-	13	14	LAN1 ACT LED-
RST SW+	15	16	SMBUS DATA
RST SW-	17	18	SMBUS CLOCK
ID SW	19	20	INTRUSION#
NC	21	22	LAN2 ACT LED+
NMI#	23	24	LAN2 ACT LED-

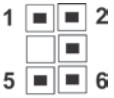
J78: 2x5-pin SAS GPIO Header (Barebones use only)



Signal	Pin	Pin	Signal
SMBUS Clock	1	2	SAS GPIO0
SMBUS Data	3	4	SAS GPIO1
GND	5	6	SAS GPIO2
KEY	7	8	SAS GPIO3
NC	9	10	ERR-LED

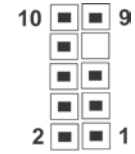


J38: LCM Module Header (Barebones use only)



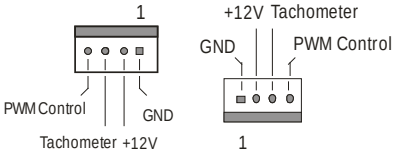
Signal	Pin	Pin	Signal
VCC	1	2	RXD2
KEY	3	4	GND
5VSB	5	6	TXD2
Use this header to connect the LCM module with system monitoring function. This header is reserved for barebones use.			

J66: 2x5-pin SAS FAULT LED Header (Barebones use only)



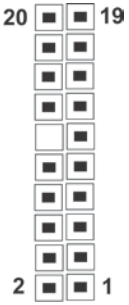
Signal	Pin	Pin	Signal
FAULT LED0	1	2	FAULT LED1
FAULT LED2	3	4	FAULT LED3
FAULT LED4	5	6	FAULT LED5
KEY	7	8	FAULT LED7
FAULT LED6	9	10	FAULT LED9

CPU1_FAN / CPU2_FAN / SYS_FAN1 / SYS_FAN2 / SYS_FAN3 / SYS_FAN4 / SYS_FAN5: 4-pin FAN Headers



Use these headers to connect the cooling fan to your motherboard to keep the system at optimum performance levels.

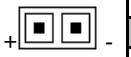
J63: 2x10-pin Fan Header (Barebones use only)



Signal	Pin	Pin	Signal
CPU_FAN_TACH1	1	2	SYS_FAN_TACH4
CPU_FAN_TACH2	3	4	SYS_FAN_TACH5
SYS_FAN_TACH1	5	6	SYS_FAN_TACH6
SYS_FAN_TACH2	7	8	SYS_FAN_TACH7
SYS_FAN_TACH3	9	10	SYS_FAN_TACH8
GND	11	12	KEY
CPU_FAN_PWM	13	14	CPU_FAN_PWM
NC	15	16	NC
NC	17	18	NC
NC	19	20	SYS_FAN_PWM

Onboard ID LED

You can identify the specific system using this LED. Users from remote site could also activate ID LED by input a few commands in IPMI, detailed software support please visit **http://www.tyan.com** for latest AST2050 user guide.



Pin	Signal	
+	P3V3_AUX	
-	SYS_ID_SW_N	
State	**Color**	**Description**
On	Blue	System identified
Off	Off	System not identified

2.4 Installing the Processor

Your S8212 supports the latest processor technologies from AMD.
Check the TYAN website for latest processor support:**http://www.tyan.com.**

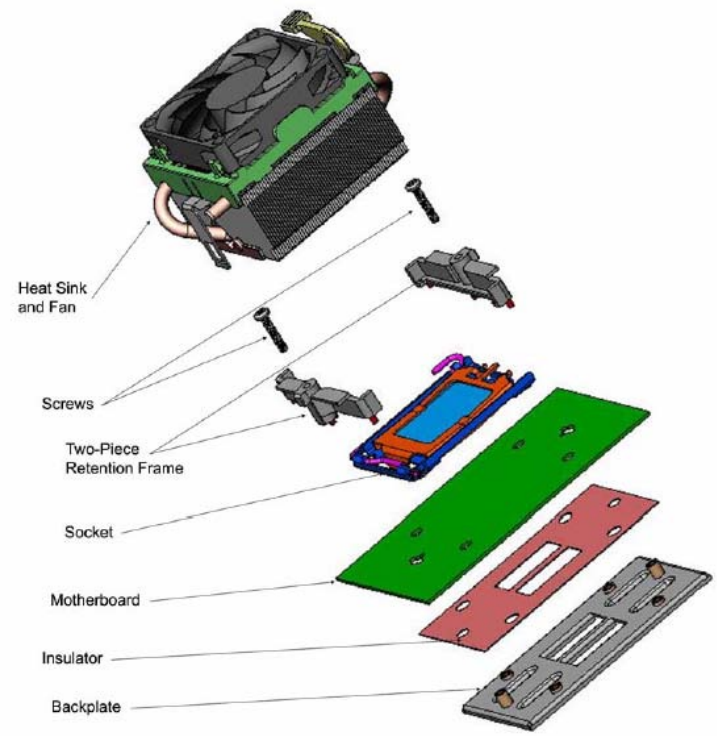


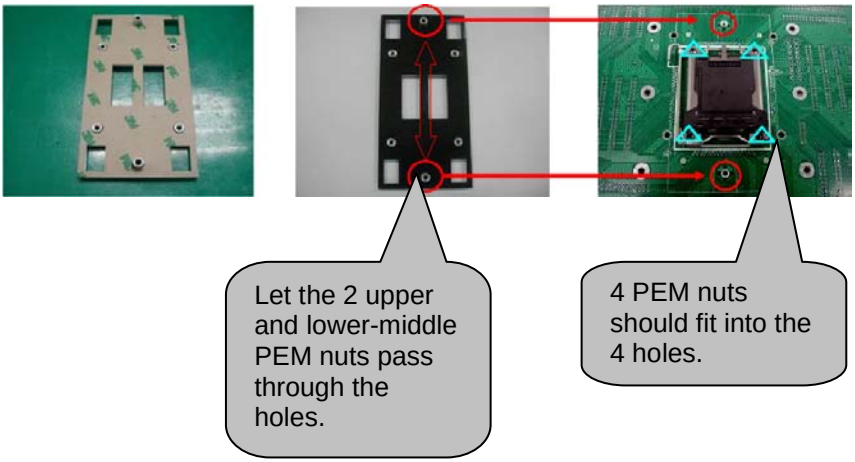
Figure 1. Detailed View of the Thermal Solution AMD PIB Platforms based on the AMD Socket F Processor.

Back plate Assembly

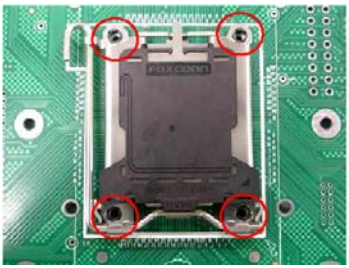
S8212 follows the AMD 1U/2S CPU keep out zone specification. Please use the 1U Rev F back plate on the S8212. The distance of two mounting holes that are used to lock the CPU heat sink down is 3.5" inches. The back plate is mounted to the backside of the motherboard and reinforces the mount locations from shock and vibrations. The back plate assembly prevents excessive motherboard stress in the area near the processor. Without a back plate, excessive stress could cause serious damage to the CPU circuitry or integrated circuits surrounding the processor. The back plate also serves as a reinforcement plate for the LGA socket.

While doing the installation, be careful in holding the components. Follow these instructions to install your back plate:

1. Remove the release liner from the back plate.
2. Align the PEM nuts on the back plate to the holes on the reverse side of the PCB.
3. First, insert the taller upper & lower middle PEM nuts through the holes of the PCB. The remaining four shorter PEM nuts should automatically fit the 4 holes on the PCB as shown in the following pictures.

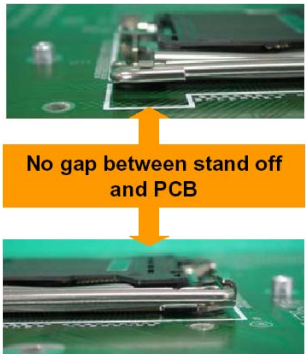


4. Locate four screw holes on socket and screw the socket to the PCB board.



NOTE: Do not assemble CPU before securing socket with screws.

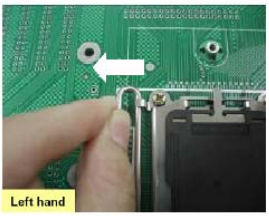
5. Inspect Socket F assembly to PCB. The Socket F must be tightly attached onto the PCB. There must NOT be any gap between stand off the PCB.

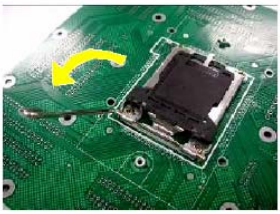


Processor Installation

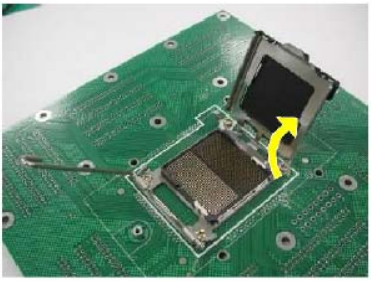
The processor should be installed carefully. Make sure you are wearing an antistatic strap and handle the processor as little as possible.
Follow these instructions to install your processor:

1. Place the PCB such that the socket cam side faces you. Make sure the lever hook is on your top-left side.
2. Use your left thumb and forefinger to hold the lever hook, then pull it to the left side to clear the retention tab.
3. Rotate the lever to a fully open position.

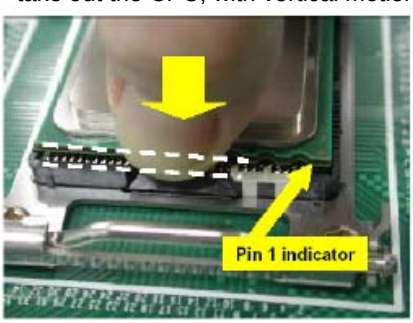




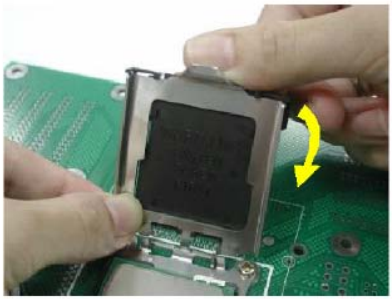
4. Lift the load plate to a fully open position.

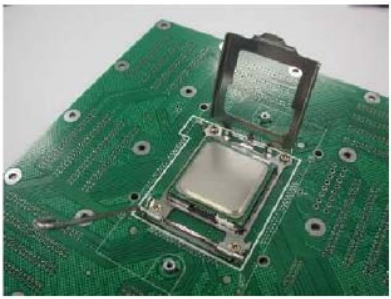


5. Locate the Pin 1 indicator of the package. Align the package with the socket and carefully insert the package into the socket with vertical motion only. Vertically check if the CPU is seated well in the socket housing. If not, take out the CPU, with vertical motion only, and repeat the above steps.

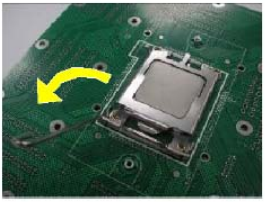


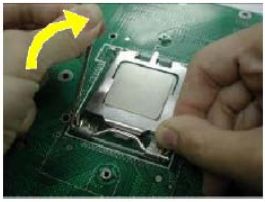
6. Remove the PnP cap. Use your left hand to hold the load plate. Then use your right thumb to remove the PnP cap from the load plate. With the package in the socket, the PnP cap removal process will not damage the contacts.





7. Close the socket. Rotate the load plate onto the package lid. Engage the load lever while pressing down lightly onto the load plate. Secure the lever near the hook end under the retention tab.

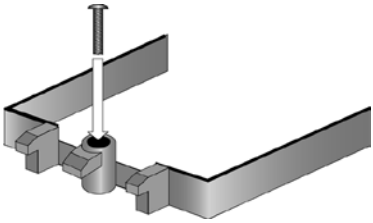




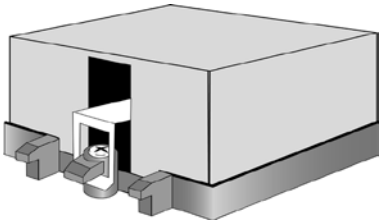
8. Repeat this procedure for the second processor if necessary.

2.5 Heat sink Installation

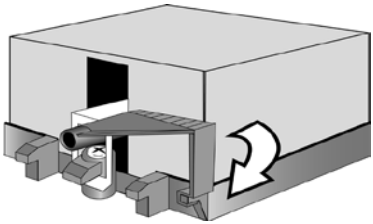
Type A: CAM LEVER (TYPE) INSTALLATION



1. After placing the back plate and interface material under motherboard，place heatsink retention frame on top of motherboard.
Align plastic retention bracket screw hole with CPU back-plate standoffs. Tighten screws to secure plastic retention bracket. Repeat for on other side.
DO NOT OVER TIGHTEN.

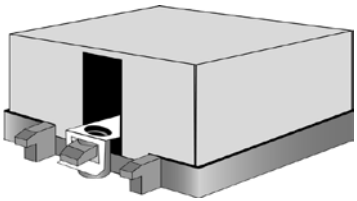


2. After tightening screws secure metal clip to plastic retention bracket center tab. Repeat for on other side of heatsink.

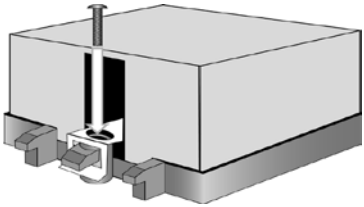


3. After securing metal clip to plastic retention bracket center tab, push down on plastic clip to lock plastic clip to side tab.

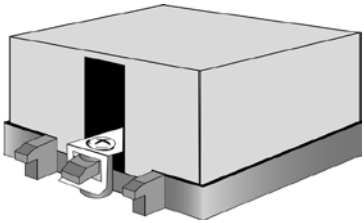
Type B: SCREW RETENTION TYPE HEATSINK



1. After placing CPU back-plate and adhesive interface material under motherboard, place heatsink retention frame on top of motherboard. Align heatsink retention frame screw hole with backplate assembly standoffs. Place heatsink inside plastic retention bracket. Place metal clip over retention frame tab. Repeat for other side.



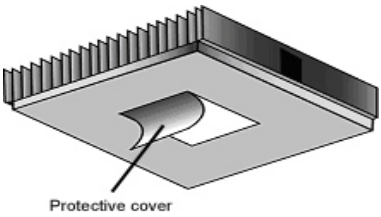
2. Insert screw through metal clip. **BE SURE METAL CLIP IS LOCKED ONTO RETENTION FRAME TAB.**



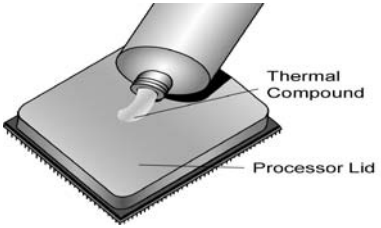
3. Tighten screw through metal clip. Repeat on the other side. **DO NOT OVER TIGHTEN.**

2.6 Thermal Interface Material

There are two types of thermal interface materials designed for use with the AMD Opteron processor.



The most common material comes as a small pad attached to the heatsink at the time of purchase. There should be a protective cover over the material. Take care not to touch this material.
Simply remove the protective cover and place the heatsink on the processor.

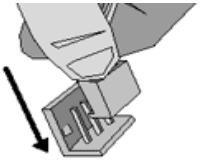


The second type of interface material is usually packaged separately, which is commonly referred to as the 'thermal compound'. Simply apply a thin layer on to the CPU lid (applying too much will actually reduce the cooling).

NOTE Always check the manufacturer of the heatsink & processor to ensure the Thermal Interface material is compatible with the processor & meets the manufacturer's warranty requirements

2.7 Finishing Installing the Heat sink

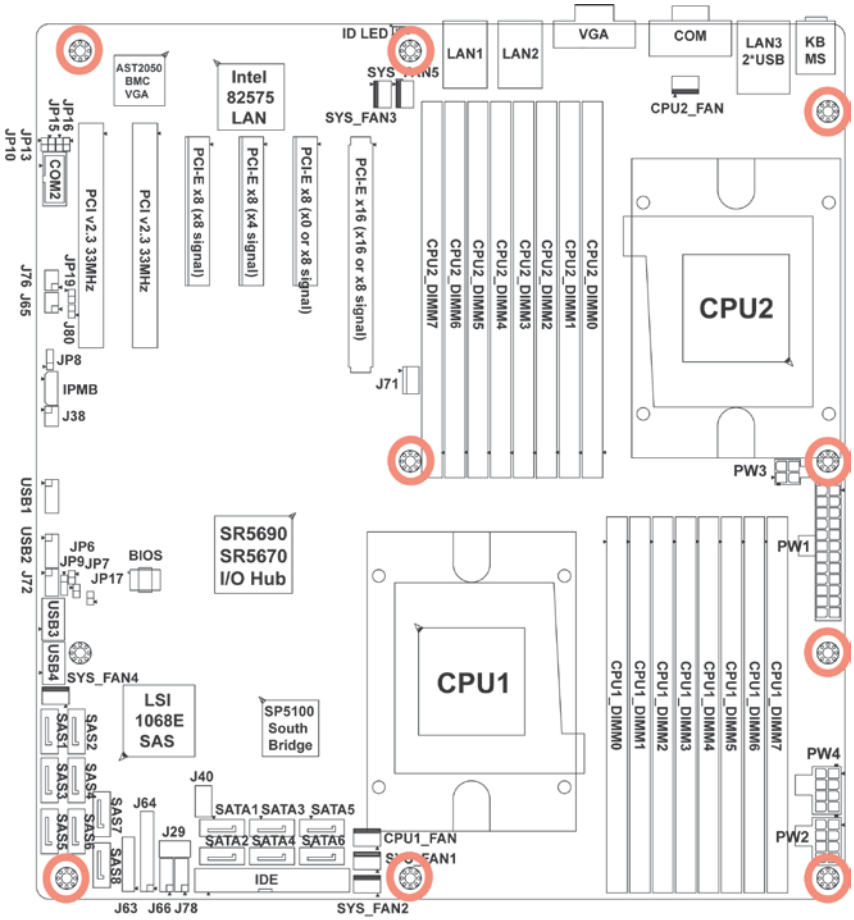
After you have finished installing the heatsink onto the processor and socket, attach the end wire of the fan (which should already be attached to the heatsink) to the motherboard. The following diagram illustrates how to connect fans onto the motherboard.



Once you have finished installing all the fans you can connect your drives (hard drives, CD-ROM drives, etc.) to your motherboard.

2.8 Tips on Installing Motherboard in Chassis

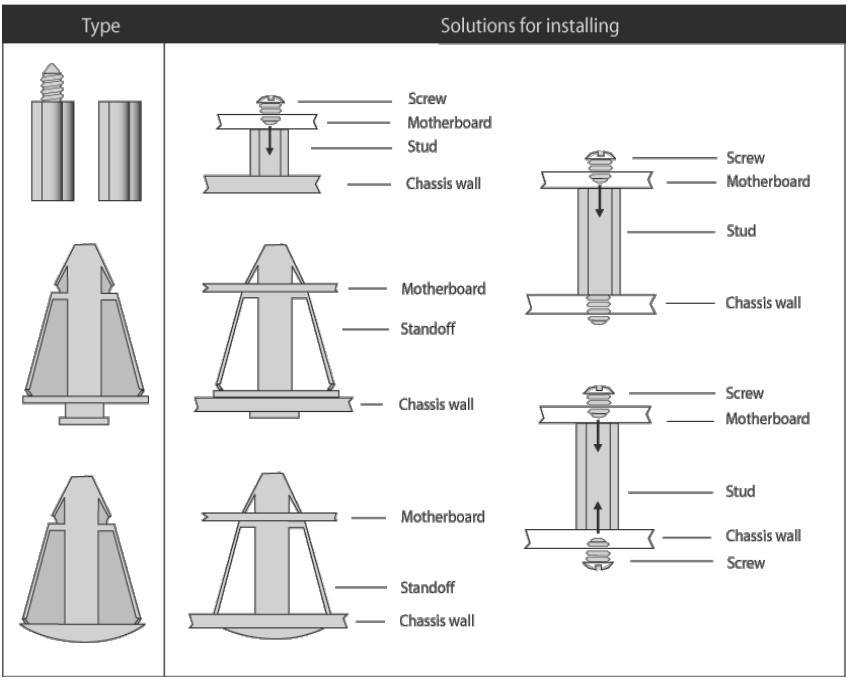
Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and golden. Usually, the chassis manufacturer will pre-install the support studs. If you are unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.



Some chassis include plastic studs instead of metal. Although the plastic studs are usable, TYAN® recommends using metal studs with screws that will fasten the motherboard more securely in place.

Below is a chart detailing what the most common motherboard studs look like and how they should be installed.

Mounting the Motherboard



TIP: Use metal studs if possible, as they hold the motherboard into place more securely than plastic standoffs.

2.9 Installing the Memory

Before attempting to install any memory, please make sure that the memory you have is compatible with the motherboard as well as the processor.
The following diagram shows common types of DDR2 memory modules.

- All installed memory will automatically be detected and no jumpers or settings will be necessary.
- Supports up to 64*/128GB of REG/ECC DDR2 533/667/800MHz memory.

NOTE Supports only up to 64GB of REG/ECC DDR2 800MHz based memory (4 DIMM's per CPU)

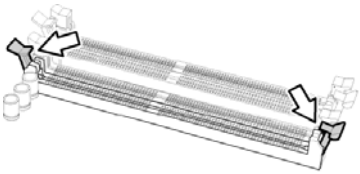
Refer to the following table for supported DDR2 configurations:
(Note: X indicates a populated DIMM slot**)**

	Single CPU Installed (CPU1 only)				Dual CPU Installed (CPU1 and CPU2)			
Population Option	1	2	3	4	5	6	7	8
CPU1_DIMM0				X				X
CPU1_DIMM1				X				X
CPU1_DIMM2			X	X			X	X
CPU1_DIMM3			X	X			X	X
CPU1_DIMM4		X	X	X		X	X	X
CPU1_DIMM5		X	X	X		X	X	X
CPU1_DIMM6	X	X	X	X	X	X	X	X
CPU1_DIMM7	X	X	X	X	X	X	X	X
CPU2_DIMM0								X
CPU2_DIMM1								X
CPU2_DIMM2							X	X
CPU2_DIMM3							X	X
CPU2_DIMM4						X	X	X
CPU2_DIMM5						X	X	X
CPU2_DIMM6					X	X	X	X
CPU2_DIMM7					X	X	X	X

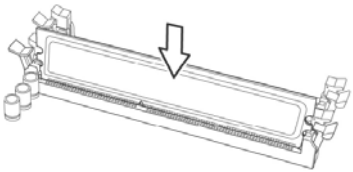
Memory Installation Procedure

When you install the memory modules, make sure the module aligns properly with the memory slot. The modules are keyed to ensure that it is inserted only one way. The method of installing memory modules are detailed by the following diagrams.

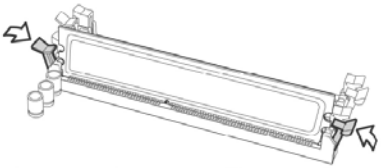
1. Press the locking levers in the direction shown in the following illustration.



2. Align the memory module with the socket. The memory module is keyed to fit only one way in the socket.



3. Seat the module firmly into the socket by gently pressing down until it sits flush with the socket. The locking levers pop up into place.



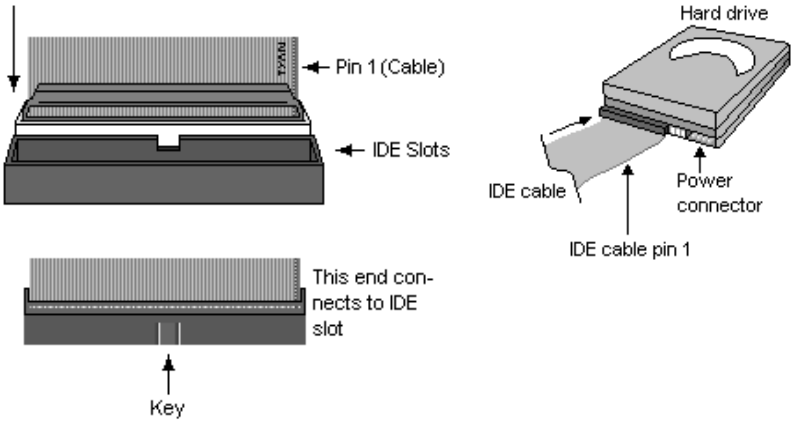
To remove the memory module, simply push the latches outwards until the memory module pops up. Then remove the module.

NOTE **YOU MUST ALWAYS** unplug the power connector from the motherboard before performing system hardware changes. Otherwise you may damage the board and/or expansion device.

2.10 Attaching Drive Cables

Attaching the IDE drive cable is simple. These cables are “keyed” to only allow them to be connected in the correct manner. TYAN® motherboards have two on-board IDE channels, each supporting two drives. **The black connector designates the Primary channel, while the white connector designates the Secondary channel.**

Attaching IDE cables to the IDE connectors is illustrated below:



Simply plug in the BLUE END of the IDE cable into the motherboard IDE connector, and the other end(s) into the drive(s). Each standard IDE cable has three connectors, two of which are closer together. The BLUE connector that is furthest away from the other two is the end that connects to the motherboard. The other two connectors are used to connect to drives.

Note: Always remember to properly set the drive jumpers. If only using one device on a channel, it must be set as Master for the BIOS to detect it.

TIP: Pin 1 on the IDE cable (usually designated by a colored wire) faces the drive’s power connector.

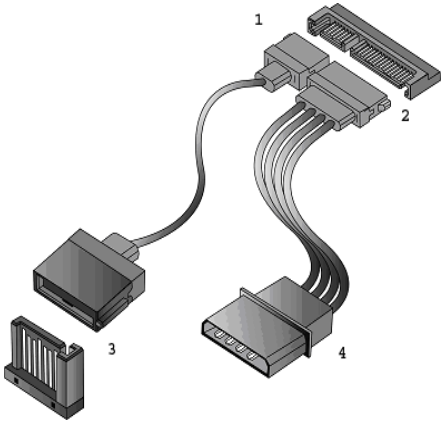
SATA Drives

The S8212 is also equipped with 6 Serial ATA (SATA) channels and 8 SAS connectors. Connections for these drives are also very simple.

There is no need to set Master/Slave jumpers on SATA drives.

TYAN® has supplied six SATA cables and three SATA power adapters. If you are in need of other cables or power adapters please contact your place of purchase.

The following pictures illustrate how to connect an SATA drive



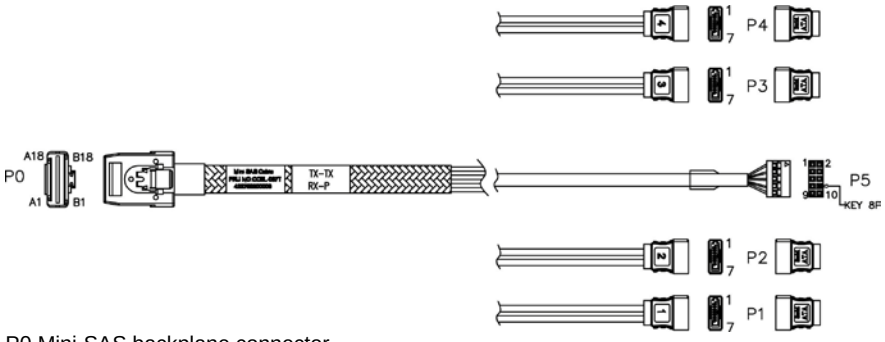
1. SATA drive cable connection

2. SATA drive power connection

3. SATA cable motherboard connector

4. SATA drive power adapter

SAS Drives



P0 Mini-SAS backplane connector

P1, P2, P3, P4 SAS cable motherboard connector

2.11 Installing Add-In Cards

Before installing add-in cards, it's helpful to know if they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the most common slots that may appear on your motherboard. Not all of the slots shown will necessarily appear on your motherboard.

PCI-E Gen.2 x 16 slot (w/ x 16 or x8 signal)

PCI-E Gen.2 x 8 open end slot (w/ x 0 or x8 signal)

PCI-E x Gen.2 x 8 open end slot (w/ x 4 signal)

PCI-E x Gen.2 x 8 open end slot (w/ x 8 signal)

Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

NOTE

YOU MUST ALWAYS unplug the power connector from the motherboard before performing system hardware changes. Otherwise you may damage the board and/or expansion device.

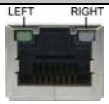
2.12 Installing I/O Shield

Connecting external devices to the motherboard is an easy task. The standard devices you should expect to plug into the motherboard are keyboards, mice, and printer cables. The following diagram will detail the ATX port stack for the following board.

Peripheral devices can be plugged straight into any of these ports bug software may be required to complete the installation.

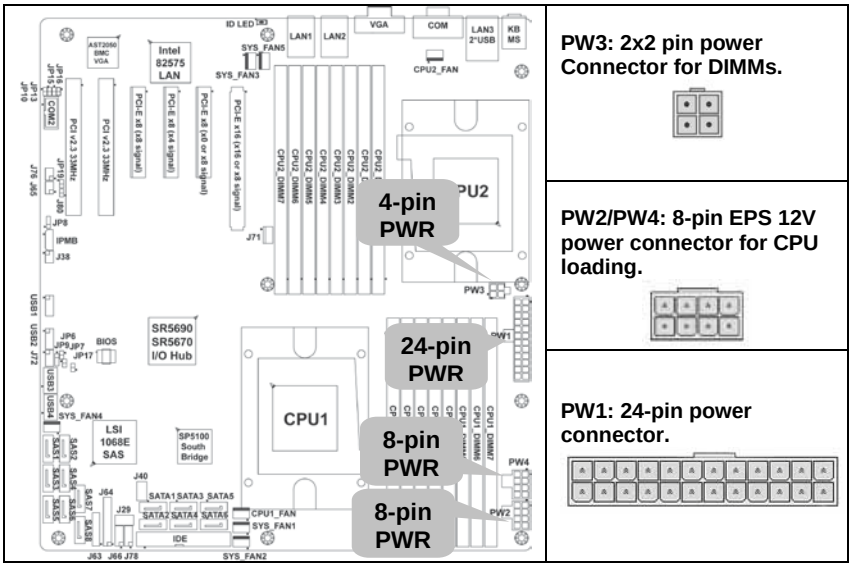
LAN LED Color Definition

The onboard Ethernet port has green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.

10/100/1000 Mbps LAN Link/Activity LED Scheme			
		**Left LED**	**Right LED**
10 Mbps	**Link**	Green	Off
	Active	Blinking Green	Off
100 Mbps	**Link**	Green	Green
	Active	Blinking Green	Green
1000 Mbps	**Link**	Green	Orange
	Active	Blinking Green	Orange
No Link		Off	Off

2.13 Installing the Power Supply

There are three power connectors on your S8212. TYAN® recommends that you have an EPS12V power supply which has one 24-pin, two 8-pin and one 4-pin power connectors.


4-pin PWR
24-pin PWR
8-pin PWR
8-pin PWR
PW3: 2x2 pin power Connector for DIMMs.
PW2/PW4: 8-pin EPS 12V power connector for CPU loading.
PW1: 24-pin power connector.

Applying power to the board

a. Connect the EPS12V 8-pin power connectors. Both PW2 and PW4 are for CPU loading. With light load processors, such as HE model, one 8pin power connector is ok. With SE model processors, the PW4 is required to be plugged.
b. Connect the EPS12V 24-pin power connector.
c. Connect the EPS12V 4-pin power connector.PW3 is for DIMMs, it is required to be connected to PSU all the time.
d. Connect power cable to power supply to power outlet

NOTE **YOU MUST** unplug the power supply from the wall outlet before plugging the power cables to motherboard connectors.

2.14 Finishing Up

Congratulations on making it this far! You're finished setting up the hardware aspect of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially IDE cables and most importantly, jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly.

In the rare circumstance that you have experienced difficulty, you can get help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by calling your vendor's support line.

Chapter 3: BIOS

3.1 About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. The BIOS determines what a computer can do without accessing programs from a disk. The BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions. This chapter describes the various BIOS settings that can be used to configure your system.
The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print and are subject to change, and therefore may not match exactly what is displayed on screen.

This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information even when the power is turned off.

To start the BIOS setup utility:
1. Turn on or reboot your system.
2. Press <Del> during POST (F4 on remote console) to start the BIOS setup utility.

3.1.1 Setup Basics

The table below shows how to navigate in the setup program using the keyboard.

Key	Function
Tab	Moves from one selection to the next
Left/Right Arrow Keys	Changes from one menu to the next
Up/Down Arrow Keys	Moves between selections
Enter	Opens highlighted section
PgUp/PgDn Keys	Changes settings.

3.1.2 Getting Help

Pressing [**F1**] will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press [**ESC**] or the [**F1**] key again.

3.1.3 In Case of Problems

If you have trouble booting your computer after making and saving the changes with the BIOS setup program, you can restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.
The best advice is to only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are absolutely sure of what you are doing. The Chipset defaults have been carefully chosen either by MiTAC or your system manufacturer for best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

3.1.4 Setup Variations

Not all systems have the same BIOS setup layout or options. While the basic look and function of the BIOS setup remains more or less the same for most systems, the appearance of your Setup screen may differ from the charts shown in this section. Each system design and chipset combination requires a custom configuration. In addition, the final appearance of the Setup program depends on the system designer. Your system designer may decide that certain items should not be available for user configuration, and remove them from the BIOS setup program.

NOTE: The following pages provide the details of BIOS menu. Please be noticed that the BIOS menu are continually changing due to the BIOS updating. The BIOS menu provided are the most updated ones when this manual is written. Please visit TYAN®'s website at http://www.tyan.com for the information of BIOS updating.

3.2 BIOS Main Menu

When you enter AMI BIOS CMOS Setup Utility, the following screen will appear as below:

AMIBIOS
This shows the core version, build date and version of BIOS,

Processor
This displays CPU information.

System Memory
This displays the amount of system memory present on the system.

System Time / System Date
System Time: Adjusts the system clock.
HH Hours (24hr. format): MM Minutes : SS Seconds
System Date: Adjusts the system date.
MM Months : DD Days : YYYY Years

3.3 BIOS Advanced Menu

This section facilitates configuring advanced BIOS options for your system.

CPU Configuration

Configure CPU.

IDE Configuration

Configure the IDE devices.

SuperIO Configuration

Configure Super IO.

Hyper Transport Configuration

Configure HT links.

ACPI Configuration

Section for Advanced ACPI Configuration.

Hardware Health Configuration

Configure / monitor the Hardware Health.

IPMI 2.0 Configuration

IPMI configuration including server monitoring and event log.

MPS Configuration

Configure the Multi-Processor Table.

PCI Express Configuration

Configure PCI Express Support.

Remote Access Configuration

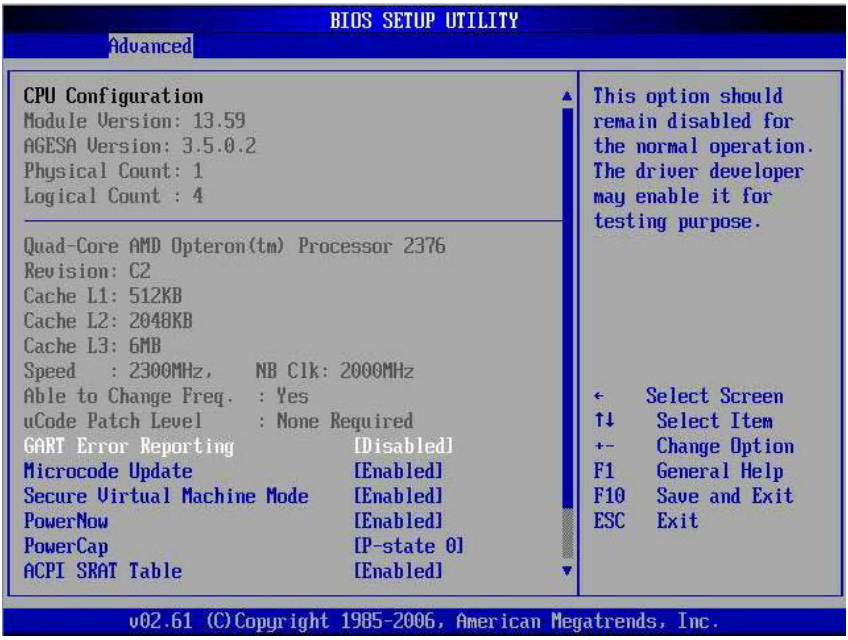
Configure Remote Access.

USB Configuration

Configure the USB support.

3.3.1 CPU Configuration

This section allows you to fine tune the processor configuration.


BIOS SETUP UTILITY
Advanced
CPU Configuration
Module Version: 13.59
AGESA Version: 3.5.0.2
Physical Count: 1
Logical Count : 4
Quad-Core AMD Opteron(tm) Processor 2376
Revision: C2
Cache L1: 512KB
Cache L2: 2048KB
Cache L3: 6MB
Speed : 2300MHz, NB Clk: 2000MHz
Able to Change Freq. : Yes
uCode Patch Level : None Required
GART Error Reporting [Disabled]
Microcode Update [Enabled]
Secure Virtual Machine Mode [Enabled]
PowerNow [Enabled]
PowerCap [P-state 0]
ACPI SRAT Table [Enabled]
This option should remain disabled for the normal operation. The driver developer may enable it for testing purpose.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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GART Error Reporting

This option should remain disabled for the normal operation. The driver developer may enable it for testing purpose

Disabled / Enabled

Microcode Update

Disabled / **Enabled**

Secure Virtual Machine Mode
Disabled / **Enabled**

PowerNow
Enable/disable the generation of ACPI_PPC, _PSS, and _PCT objects.
Disabled / **Enabled**

PowerCap

This option can decide the highest performance P-state in OS.
P-state 0 / P-state 1 / P-state 2 / P-state 3 / P-state 4

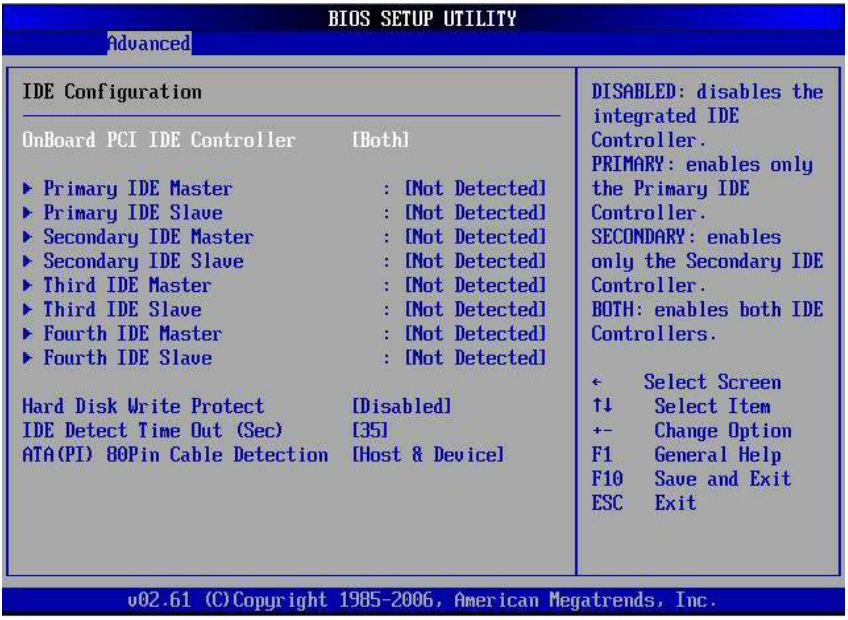
ACPI SRAT Table
Enable or disable the building of ACPI SRAT Table.
Disabled / **Enabled**

CPU Prefetching
Enable or disable CPU prefetching.
Disabled / **Enabled**

IO Prefetching
Enable or disable IO prefetching.
Disabled / **Enabled**

Probe Filter
Initialization mode for Probe Filter.
Auto / Disabled / MP Mode

3.3.2 Advanced IDE Configuration


BIOS SETUP UTILITY
Advanced
IDE Configuration
OnBoard PCI IDE Controller [Both]
▶ Primary IDE Master : [Not Detected]
▶ Primary IDE Slave : [Not Detected]
▶ Secondary IDE Master : [Not Detected]
▶ Secondary IDE Slave : [Not Detected]
▶ Third IDE Master : [Not Detected]
▶ Third IDE Slave : [Not Detected]
▶ Fourth IDE Master : [Not Detected]
▶ Fourth IDE Slave : [Not Detected]
Hard Disk Write Protect [Disabled]
IDE Detect Time Out (Sec) [35]
ATA(PI) 80Pin Cable Detection [Host & Device]
DISABLED: disables the integrated IDE Controller.
PRIMARY: enables only the Primary IDE Controller.
SECONDARY: enables only the Secondary IDE Controller.
BOTH: enables both IDE Controllers.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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OnBoard PCI IDE Controller
DISABLED: disables the integrated IDE Controller.
PRIMARY: enables only the Primary IDE Controller.
SECONDARY: enables only the Secondary IDE Controller.
BOTH: enables both IDE Controllers.

Primary/Secondary/Third/Fourth IDE Master
While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.

Hard Disk Write Protect

Disable/Enable device write protection. This will be effective only if device is accessed through BIOS.

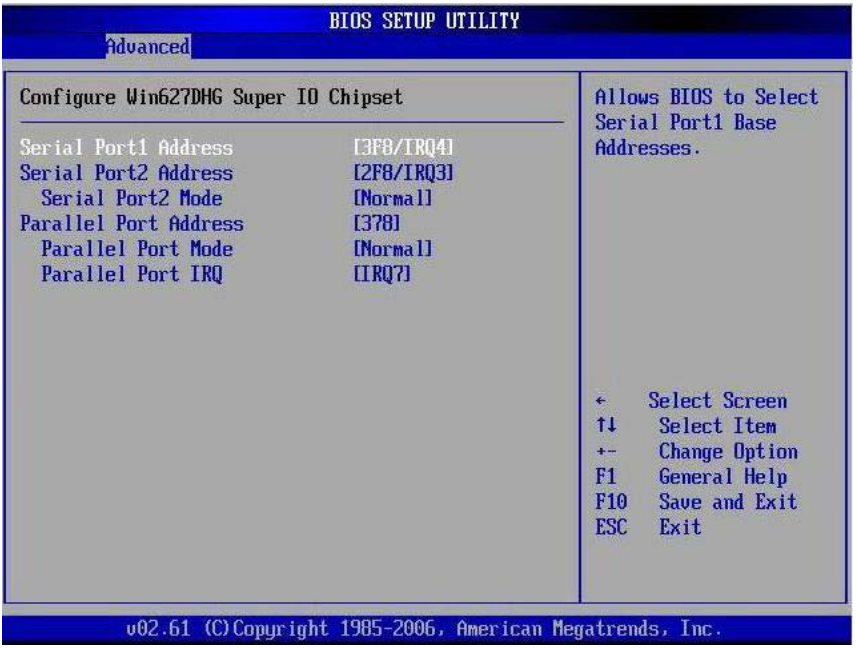
Disabled / Enabled

IDE Detect Time Out (Sec)
Select the time out value for detecting ATA/ATAPI device(s).

0~35 (at 5 interval)

ATA(PI) 80Pin Detection
Select the mechanism for detecting 80Pin ATA(PI) Cable. [Host & Device]

3.3.3 Advanced Super IO Configuration



Serial Port1 Address
Allows BIOS to Select Serial Port 1Base Address.
Disabled / **[3F8/IRQ4]** / [2E8/IRQ3]

Serial Port2 Address
Allows BIOS to Select Serial Port 2 Base Address.
Disabled / **[2F8/IRQ3]** / [2E8/IRQ3]

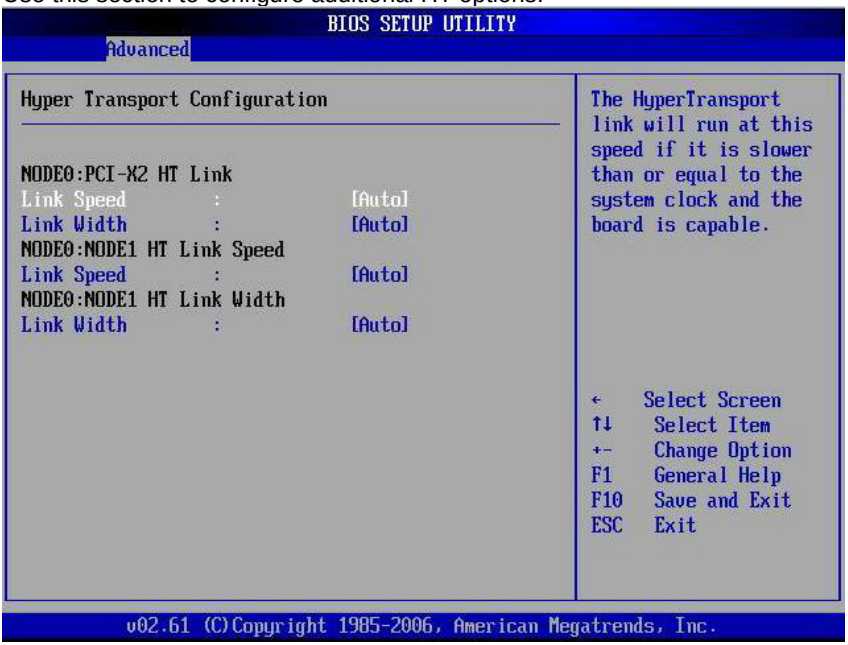
Serial Port2 Mode
Allows BIOS to Select mode for Serial Port 2.
Normal / IrDA / Ask IR

Parallel Port Address
Allows BIOS to Select Parallel Port Base Address.
Disabled / 378 / 278 / 3BC

Parallel Port IRQ
Allows BIOS to Select Parallel Port IRQ.
IRQ5 / **IRQ7**

3.3.4 Advanced Hyper Transport Configuration

Use this section to configure additional HT options.


BIOS SETUP UTILITY
Advanced
Hyper Transport Configuration
NODE0:PCI-X2 HT Link
Link Speed : [Auto]
Link Width : [Auto]
NODE0:NODE1 HT Link Speed
Link Speed : [Auto]
NODE0:NODE1 HT Link Width
Link Width : [Auto]
The HyperTransport link will run at this speed if it is slower than or equal to the system clock and the board is capable.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Link Speed

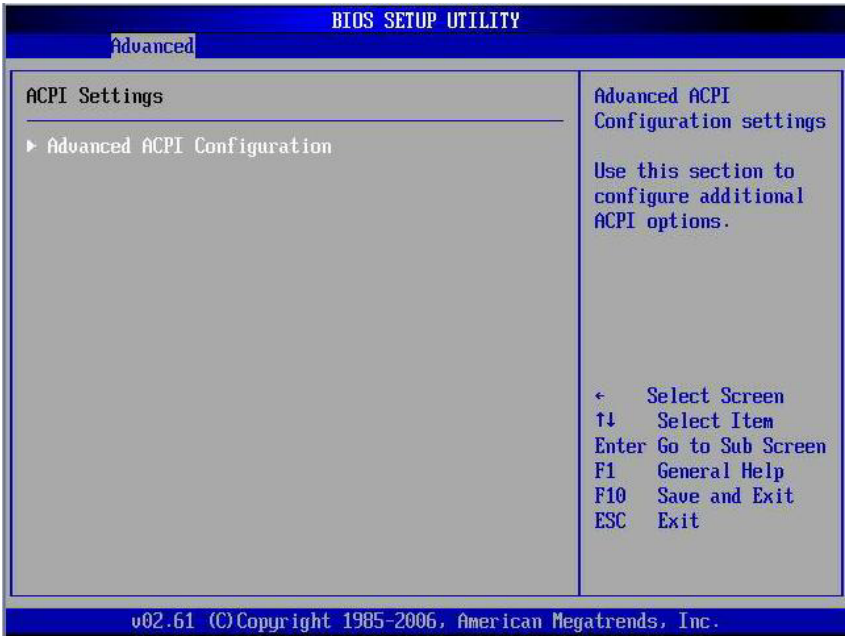
The HyperTransport link will run at this speed if it is slower than or equal to the system clock and the board is capable.
200 MHz / 400 MHz / 600 MHz / 800 MHz / 1 GHz / 1.2 GHz / 1.4 GHz / 1.6 GHz / 1.8 GHz / 2.0 GHz / **Auto**

Link Width

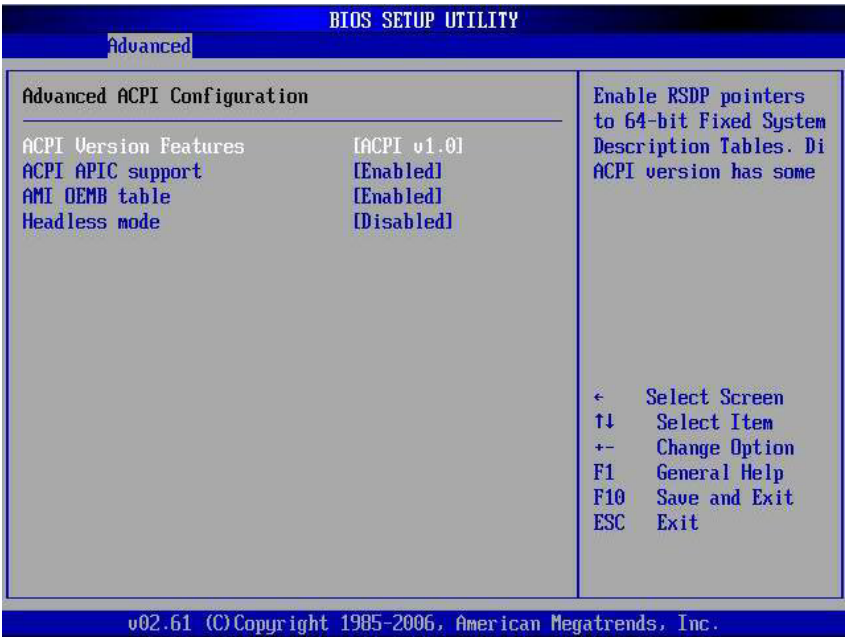
The HyperTransport link will run at this width.
4 Bit / 8 Bit / 16 Bit / **Auto**

3.3.5 Advanced ACPI Configuration

Use this section to configure additional ACPI options.



3.3.5.1 Advanced ACPI Configuration


BIOS SETUP UTILITY
Advanced
Advanced ACPI Configuration
ACPI Version Features [ACPI v1.0]
ACPI APIC support [Enabled]
AMI OEMB table [Enabled]
Headless mode [Disabled]
Enable RSDP pointers to 64-bit Fixed System Description Tables. Di ACPI version has some
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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ACPI Version Features
Set this value to allow or prevent the system to be complaint with the ACPI 2.0 specification.

ACPI 3.0 **/ ACPI 2.0** / ACPI 1.0

ACPI APIC Support
This option allows you to define whether or not to enable APIC features.

Enabled / Disabled

AMI OEMB Table
Set this value to allow the ACPI BIOS to add a pointer to an OEMB table in the Root System Description Table (RSDT) table.

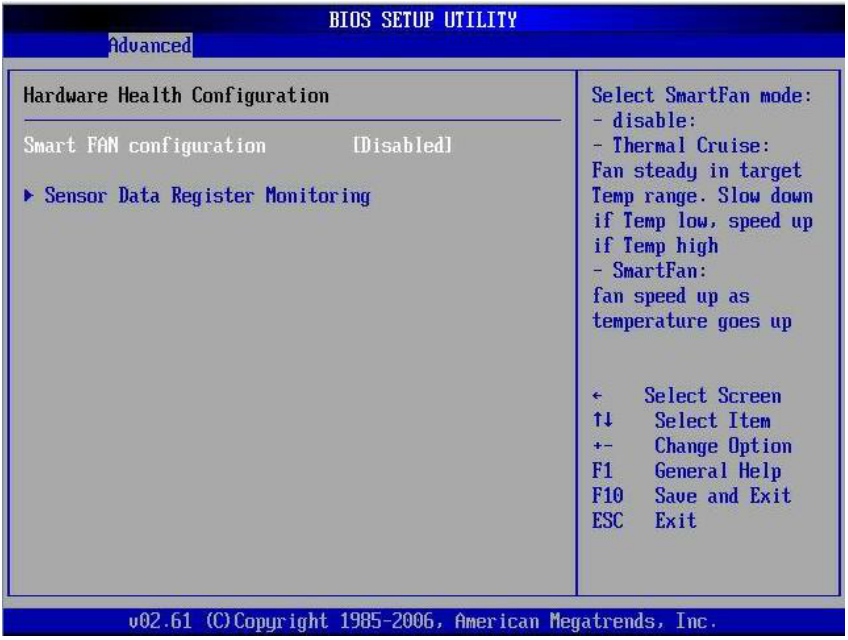
Enabled / Disabled

NOTE: OEMB table is used to pass POST data to the AMI code during ACPI O/S operations.

Headless Mode
Enable or disable Headless operation mode through ACPI.

Disabled / Enabled

3.3.6 Advanced Hardware Health Configuration

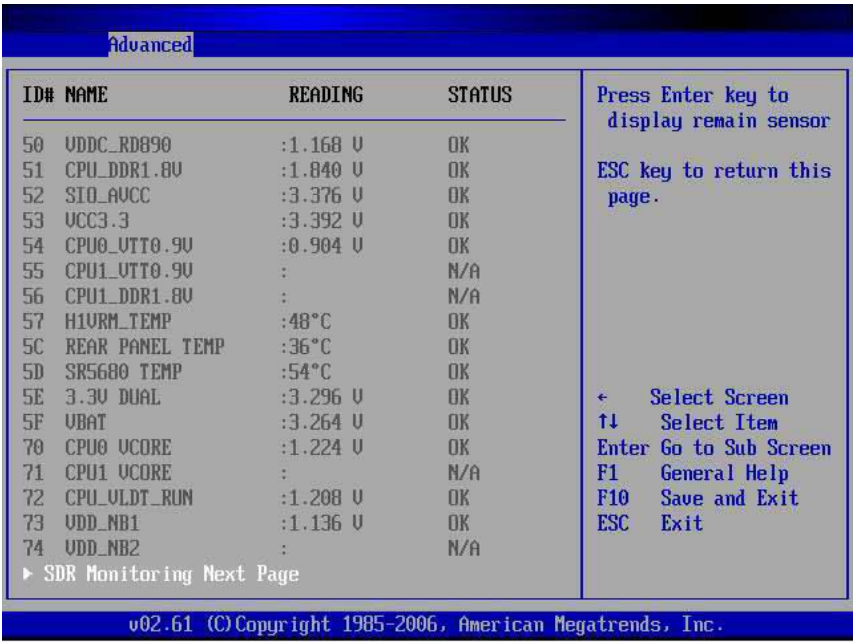


Smart FAN configuration
Select SmartFan mode:
- Disable;
- Thermal Cruise: Fan steady in tartget Temp range. Slow down if Temp low, speed up if Temp high.
- Smart Fan: fan speed up as temperature goes up.

Sensor Data Register Monitoring
Sensor Monitoring for BMC.

3.3.6.1 Sensor Data Register Monitoring

Sensor Monitoring for BMC.


Advanced
ID# NAME READING STATUS
50 VDDC_RD890 :1.168 V OK
51 CPU_DDR1.8V :1.840 V OK
52 SIO_AVCC :3.376 V OK
53 VCC3.3 :3.392 V OK
54 CPU0_VTT0.9V :0.904 V OK
55 CPU1_VTT0.9V : N/A
56 CPU1_DDR1.8V : N/A
57 H1VRM_TEMP :48°C OK
5C REAR PANEL TEMP :36°C OK
5D SR5680 TEMP :54°C OK
5E 3.3V DUAL :3.296 V OK
5F VBAT :3.264 V OK
70 CPU0 VCORE :1.224 V OK
71 CPU1 VCORE : N/A
72 CPU_VLDT_RUN :1.208 V OK
73 VDD_NB1 :1.136 V OK
74 VDD_NB2 : N/A
▶ SDR Monitoring Next Page
Press Enter key to display remain sensor
ESC key to return this page.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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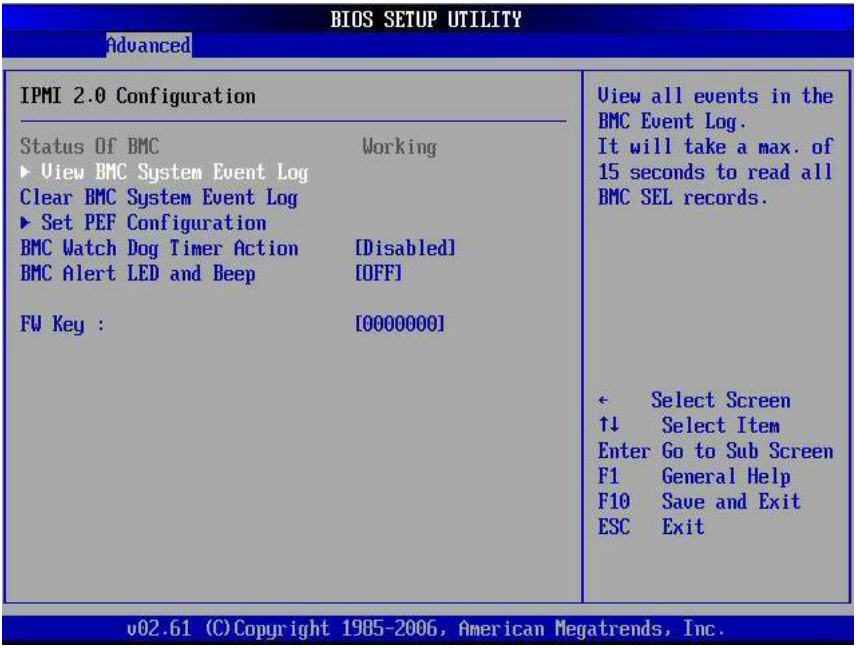
Read only. It can not be modified in user mode.

3.3.7 IPMI 2.0 Configuration


BIOS SETUP UTILITY
Advanced
IPMI 2.0 Configuration
Status Of BMC
Working
▶ View BMC System Event Log
Clear BMC System Event Log
▶ Set PEF Configuration
BMC Watch Dog Timer Action
[Disabled]
BMC Alert LED and Beep
[OFF]
FW Key :
[0000000]
View all events in the BMC Event Log. It will take a max. of 15 seconds to read all BMC SEL records.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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View BMC System Event Log
View all events in the BMC Event Log. It will take a max. of 15 seconds to read all BMC SEL records.

Clear BMC System Event Log
Clear all evens in BMC System Event Log.

Set PEF Configuration
Set PEF Configuration Parameters Command. (Parameter #1 to 4)

BMC Watch Dog Timer Action
Allows the BMC to reset or power down the system if the operating system crashes or hangs.

Disabled / Enable

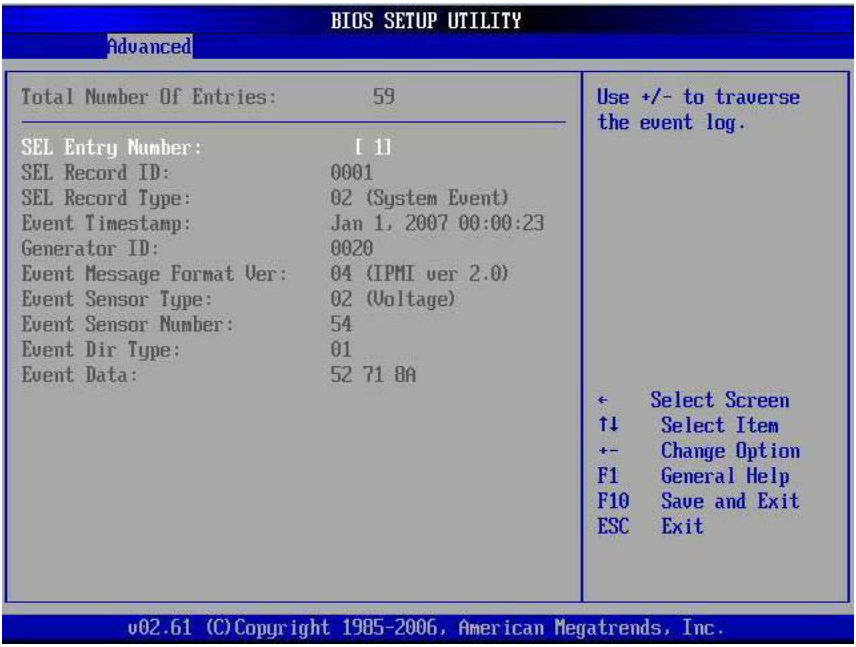
BMC Alert LED and Beep
BMC Alert LED and Beep

ON / **OFF**

FW Key
Enter IPMI FW Key upgrade to IPMI or iKVM function.

[0000000]

3.3.7.1 View BMC System Event Log


BIOS SETUP UTILITY
Advanced
Total Number Of Entries: 59
SEL Entry Number: [1]
SEL Record ID: 0001
SEL Record Type: 02 (System Event)
Event Timestamp: Jan 1, 2007 00:00:23
Generator ID: 0020
Event Message Format Ver: 04 (IPMI ver 2.0)
Event Sensor Type: 02 (Voltage)
Event Sensor Number: 54
Event Dir Type: 01
Event Data: 52 71 8A
Use +/- to traverse the event log.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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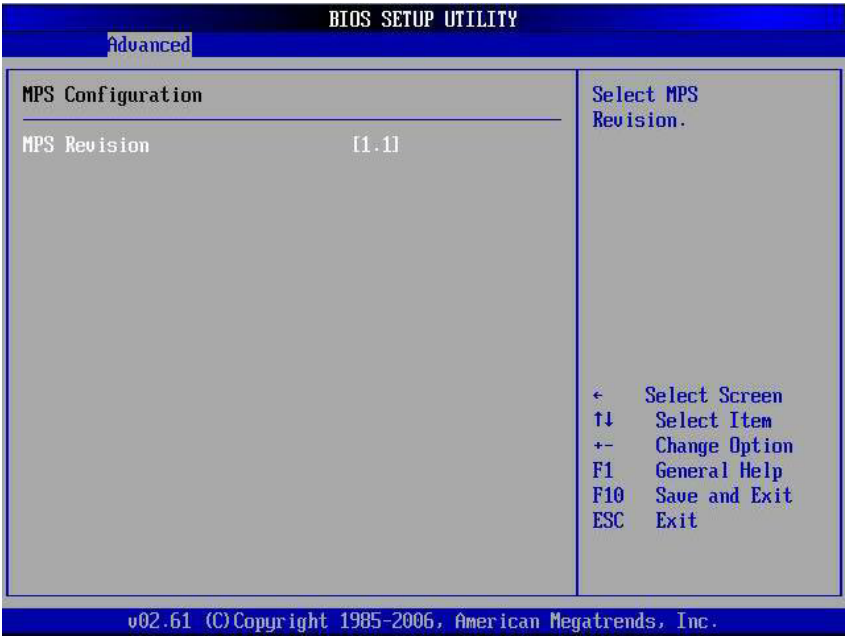
3.3.7.2 Set PEF Configuration Parameters Command

Enable or Disable PEF Support.

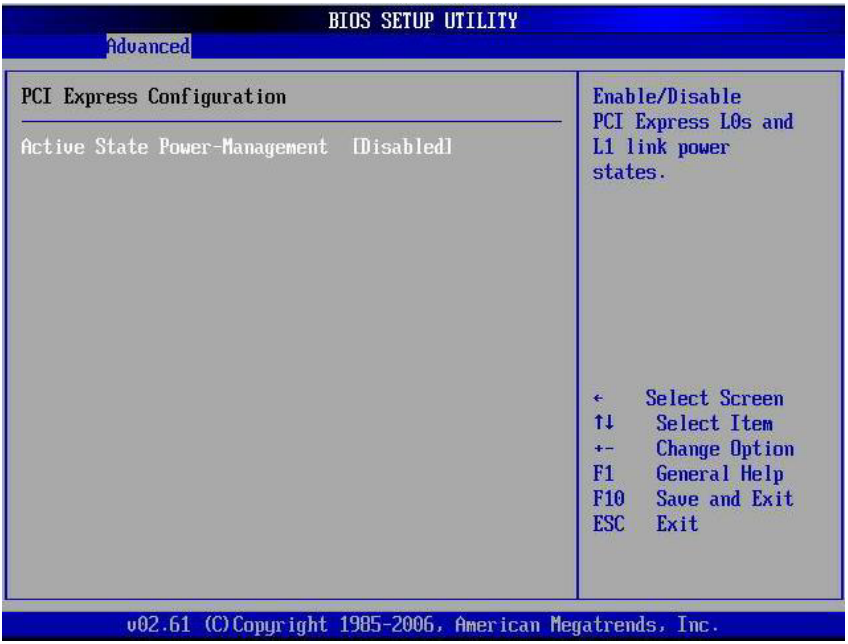
3.3.8 MPS Configuration

Configure the Multi-Processor Table.



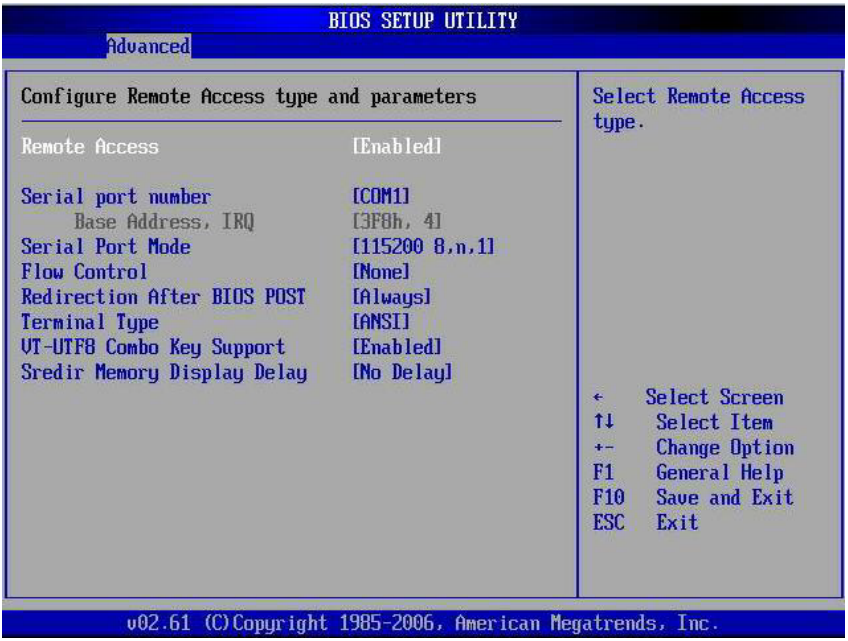
Select MPS Revision
[1.1] / **[1.4]**

3.3.9 PCI-Express Configuration



Enable or Disable PCI Express L0 and L1 link power states.

3.3.10 Remote Access Configuration



Remote Access
Enables remote access to system through serial port.
Disabled / Enabled

Serial port number
Select Serial Port for console redirection. Make sure the selected port is enabled.
COM1/ COM2 / COM3 (virtual for BMC)

Serial Port Mode
Select Serial Port settings.

Flow Control
Select Flow Control for console redirection.
None / Hardware / Software

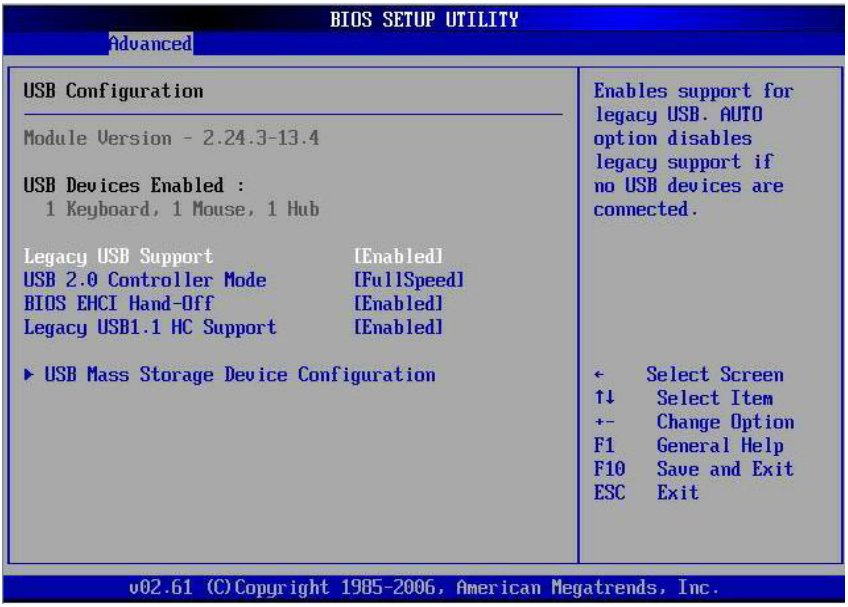
Redirection After BIOS POST
Disabled: Turns off the redirection after POST Boot Loader;
Boot Loader: Redirection is active during POST and during Boot Loader;
Always: Redirection is always active. (Some OSs may not work if set to Always)
Terminal Type

Select the target terminal type.
ANSI / VT100 / VT-UTF8

VT-UTF8 Combo Key Support
Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.
Disabled / **Enable**

Sredir Memory Display Delay
Gives the delay in seconds to display memory information.
No Delay / Delay 1 Sec / Delay 2 Sec / Delay 4 Sec

3.3.11 USB Configuration


BIOS SETUP UTILITY
Advanced
USB Configuration
Module Version - 2.24.3-13.4
USB Devices Enabled :
1 Keyboard, 1 Mouse, 1 Hub
Legacy USB Support [Enabled]
USB 2.0 Controller Mode [FullSpeed]
BIOS EHCI Hand-Off [Enabled]
Legacy USB1.1 HC Support [Enabled]
▶ USB Mass Storage Device Configuration
Enables support for legacy USB. AUTO option disables legacy support if no USB devices are connected.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Legacy USB Support
Enables support for legacy USB. AUTO option disables legacy support if no USB devices are connected.

Disabled / Enabled / Auto

USB 2.0 Controller Mode
Configure the USB 2.0 controller in Hi Speed (480 Mbps) or Full Speed (12Mbps).

Hi Speed / Full Speed

BIOS EHCI Hand-OFF
This is a work around for OSes without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.

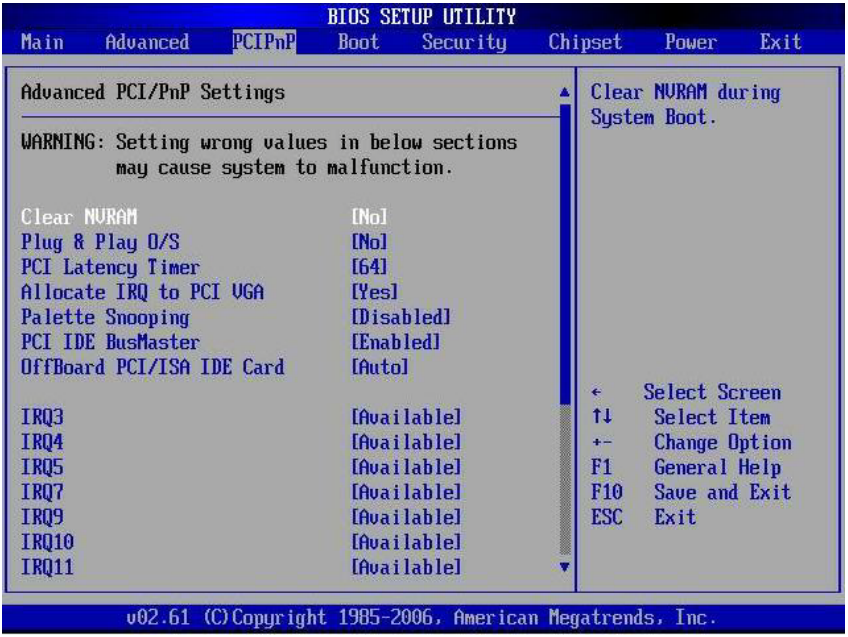
Enabled / Disabled

Legacy USB1.1 HC Support
Enables support for legacy USB. AUTO option disables legacy support if no USB devices are connected.

Enabled / Disabled

USB Mass Storage Device Configuration
Configure the USB Mass Storage Class Devices.

3.4 PCI/PnP Menu



Clear NVRAM
Clears NVRAM during system Boot.
No / Yes

Plug & Play O/S
No: lets the BIOS configure all the devices in the system.
Yes: lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.
No / Yes

PCI Latency Timer
This setting controls how many PCI clocks each PCI device can hold the bus before another PCI device takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth.
Values in units of PCI clocks for PCI device latency timer register
64 / 32 / 96 / 128 / 160 / 192 / 224 / 248

Allocate IRQ to PCI VGA
Yes: assigns IRQ to PCI VGA card if card requests IRQ.
Yes / No

Palette Snooping
This is the default setting and should not be changed unless the VGA card manufacturer requires Palette Snooping to be Enabled.
Enabled: informs the PCI devices that an ISA graphics device is installed in the system so the card will function correctly.
Disabled / Enabled

PCI IDE Bus Master
Enabled: BIOS uses PCI bus mastering for reading / writing to IDE drives.
Enabled / Disabled

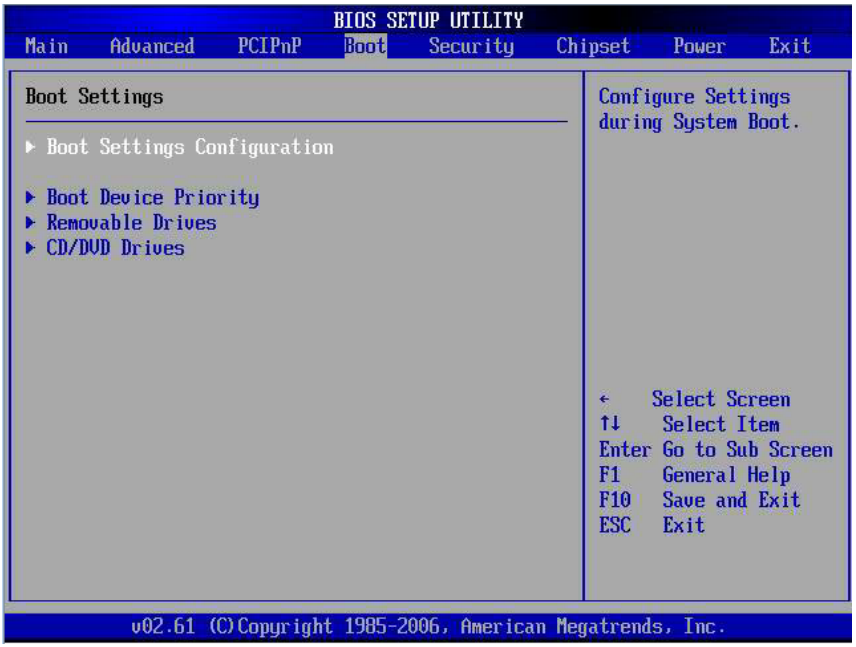
OffBoard PCI/ISA IDE Card
Some PCI IDE cards may require this to be set to the PCI slot number that is holding the card.
AUTO: Works for most PCI IDE cards.
Auto / PCI Slot1 / PCI Slot2 / PCI Slot3 / PCI Slot4 / PCI Slot5 / PCI Slot6

IRQ
Available: Specified IRQ is available to be used by PCI/PnP devices.
Reserved: Specified IRQ is reserved for use by Legacy ISA devices.

DMA Channel
Available: Specified DMA is available to be used by PCI/PnP devices.
Reserved: Specified DMA is reserved for use by Legacy ISA devices.

Reserved Memory Size
Size of memory block to reserve for legacy ISA devices.
Disabled / 16k / 32k / 64k

3.5 Boot Menu



Boot Settings Configuration

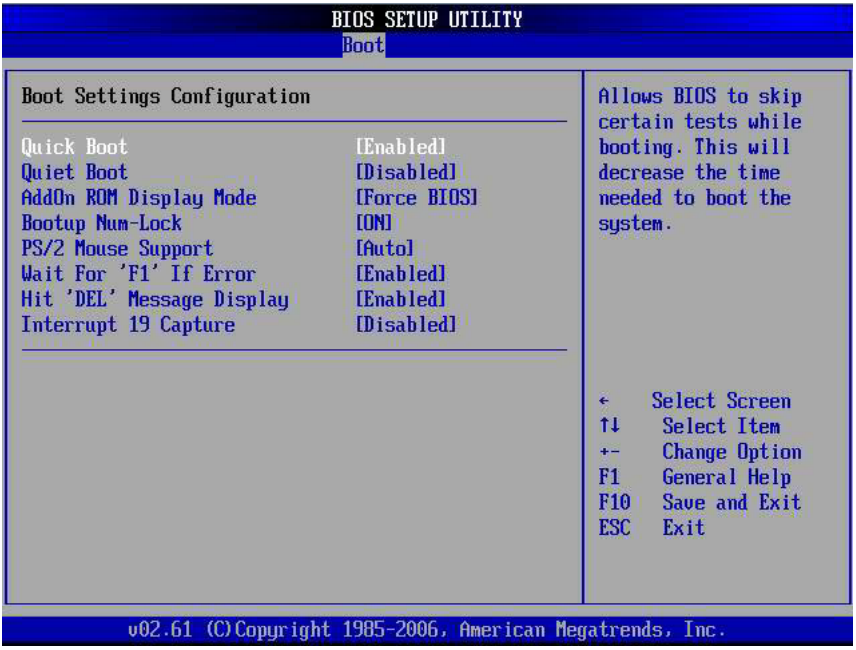
Configure Settings during System Boot.

Boot Device Priority
Specifies the Boot Device Priority sequence.

Removable Drives
Specifies the Boot Device Priority sequence from available Removable Drives.

CD/DVD Drives
Specifies the Boot Device Priority sequence from available CD/DVD Drives.

3.5.1 Boot Settings Configuration


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Disabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [ON]
PS/2 Mouse Support [Auto]
Wait For 'F1' If Error [Enabled]
Hit 'DEL' Message Display [Enabled]
Interrupt 19 Capture [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Quick Boot
This option allows user bypass BIOS self test during POST.
Enabled / Disabled

Quiet Boot
Disabled: displays normal POST messages.
Enabled: displays OEM log instead of POST messages.
Disabled / Enabled

Add On ROM Display Mode
Allows user to force BIOS/Option ROM of add-on cards to be displayed during quiet boot.
Force BIOS / Keep Current

Boot Up Num-Lock
Selects Power-on state for Numlock.
On / Off

PS/2 Mouse Support
Select support for PS/2 Mouse.
Auto / Enabled / Disabled

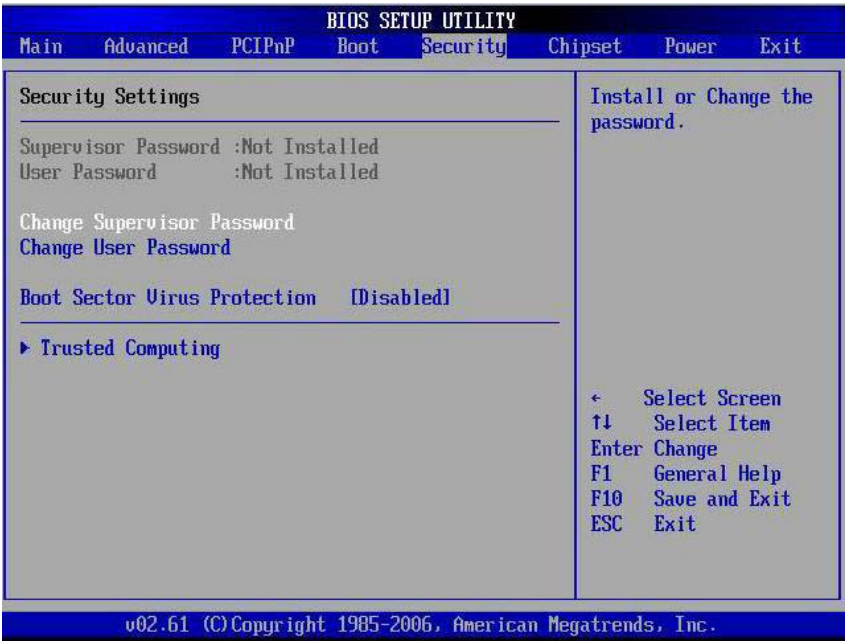
Wait for 'F1' If Error

Waits for F1 key to be present if error occurs.
Enabled / Disabled

Hit 'DEL' Message Display
Displays "Press DEL to run Setup in POST".
Enabled / Disabled

Interrupt 19 Capture
Enabled: allows option ROMs to trap interrupt 19.
Enabled / Disabled

3.6 Security Menu



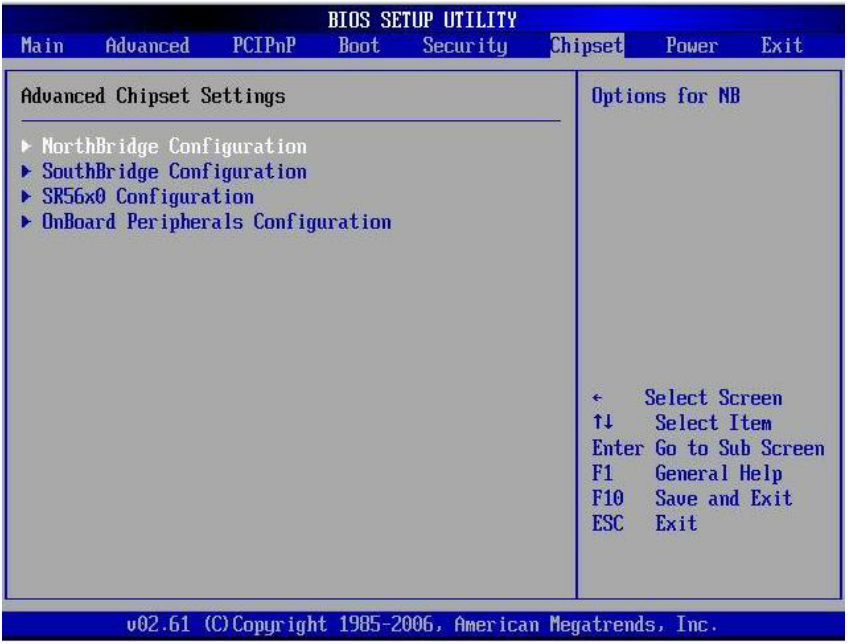
Change Supervisor Password
Install or Change the password.

Change User Password
Install or Change the password.

Boot Sector Virus Protection
When it is set to [Enabled], BIOS will issue a virus warning message and beep if a write to the boot sector or the partition table of the HDD is attempted.
Disabled / Enabled

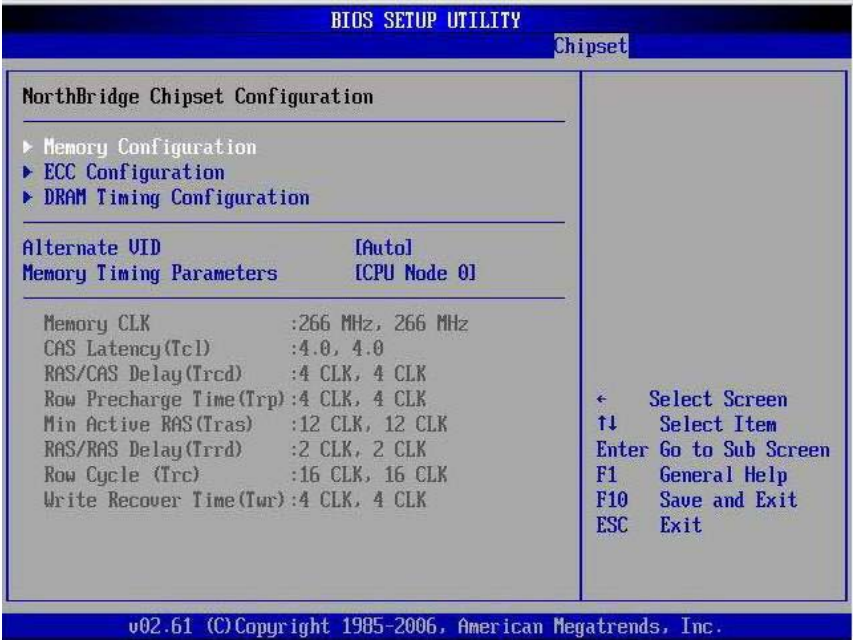
Trusted Computing
Configure settings related to Trusted Computing innovations.
To Enable / Disable TPM TCG (TPM 1.1/1.2) support in BIOS.
No / Yes

3.7 Chipset Menu



Allows you to change NorthBridge, SouthBridge, or OnBoard Peripherals Configuration

3.7.1 North Bridge Chipset Configuration


BIOS SETUP UTILITY
Chipset
NorthBridge Chipset Configuration
Memory Configuration
ECC Configuration
DRAM Timing Configuration
Alternate VID [Auto]
Memory Timing Parameters [CPU Node 0]
Memory CLK :266 MHz, 266 MHz
CAS Latency(Tcl) :4.0, 4.0
RAS/CAS Delay(Trcd) :4 CLK, 4 CLK
Row Precharge Time(Trp) :4 CLK, 4 CLK
Min Active RAS(Tras) :12 CLK, 12 CLK
RAS/RAS Delay(Trrd) :2 CLK, 2 CLK
Row Cycle (Trc) :16 CLK, 16 CLK
Write Recover Time(Twr) :4 CLK, 4 CLK
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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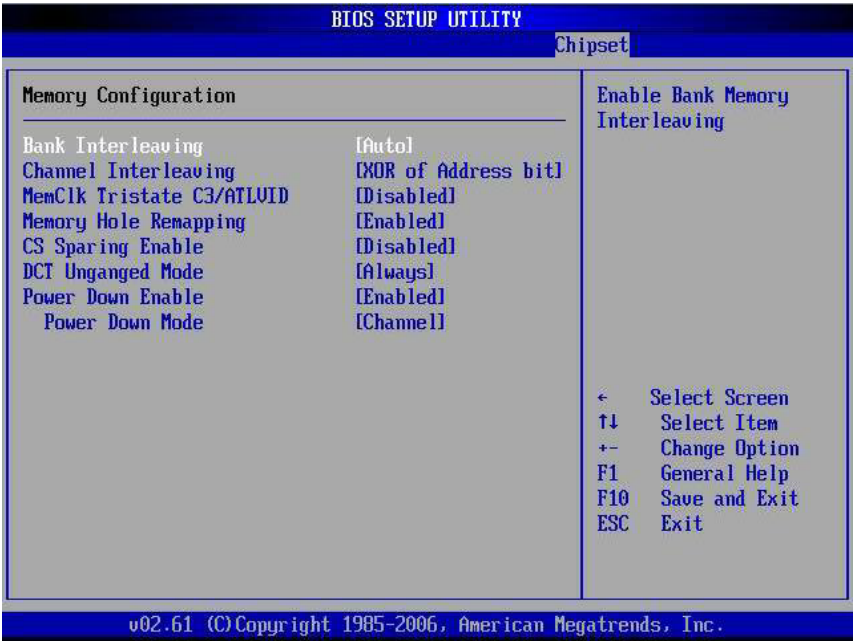
Alternate VID
Specify the alternate VID while in low power states.

Memory Timing Parameters
To select which node's timing parameters to display.
CPU Node 0 / CPU Node 1

3.7.1.1 Memory Configuration



Bank Interleaving
Enable or Disable Bank Memory Interleaving.
Auto / Disabled

Channel Interleaving
Enable or Disable Channel Memory Interleaving.
Disabled / Address bits 6 / Address bits 12 / **XOR of Address bits [20:16, 6]** / XOR of Address bits [20:16, 9]

MemClk Tristate C3/ATLVID
Enable or Disable MemClk Tri-Stating during C3 and Alt VID.
Disabled / Enabled

Memory Hole Remapping
Enable or Disable Memory Hold remapping.
Enabled / Disabled

CS Sparing Enable
Reserve a spare memory rank in each node.
Disabled / Enabled

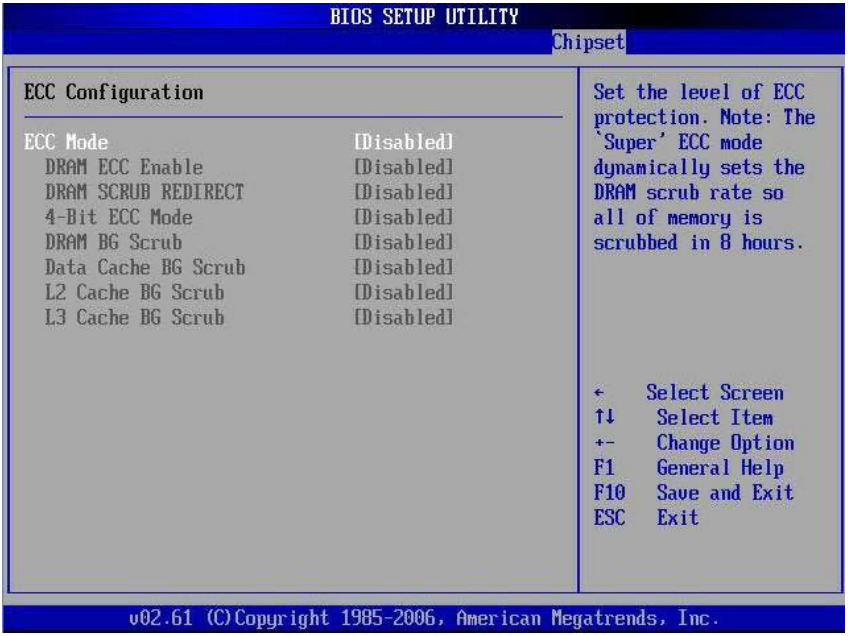
DCT Unganged Mode
This allows selection of unganged DRAM mode (64-bit width).

Auto = Ganged mode
Always = Unganged mode

Power Down Enable
Enable or Disable DDR power down mode.
Enabled / Disabled

Power Down Mode
Set the DDR power down mode.
Channel / Chip select

3.7.1.2 ECC Configuration


BIOS SETUP UTILITY
Chipset
ECC Configuration
ECC Mode [Disabled]
DRAM ECC Enable [Disabled]
DRAM SCRUB REDIRECT [Disabled]
4-Bit ECC Mode [Disabled]
DRAM BG Scrub [Disabled]
Data Cache BG Scrub [Disabled]
L2 Cache BG Scrub [Disabled]
L3 Cache BG Scrub [Disabled]
Set the level of ECC protection. Note: The 'Super' ECC mode dynamically sets the DRAM scrub rate so all of memory is scrubbed in 8 hours.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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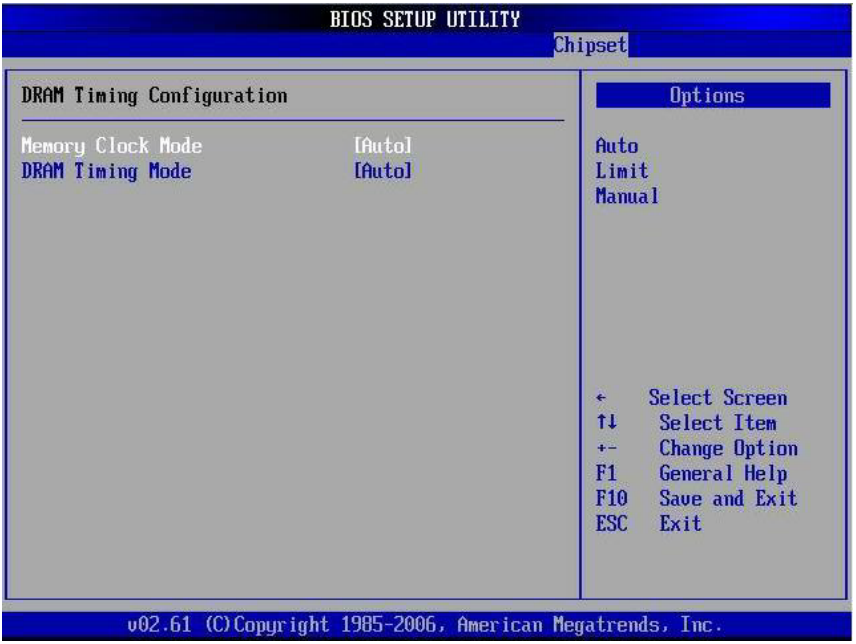
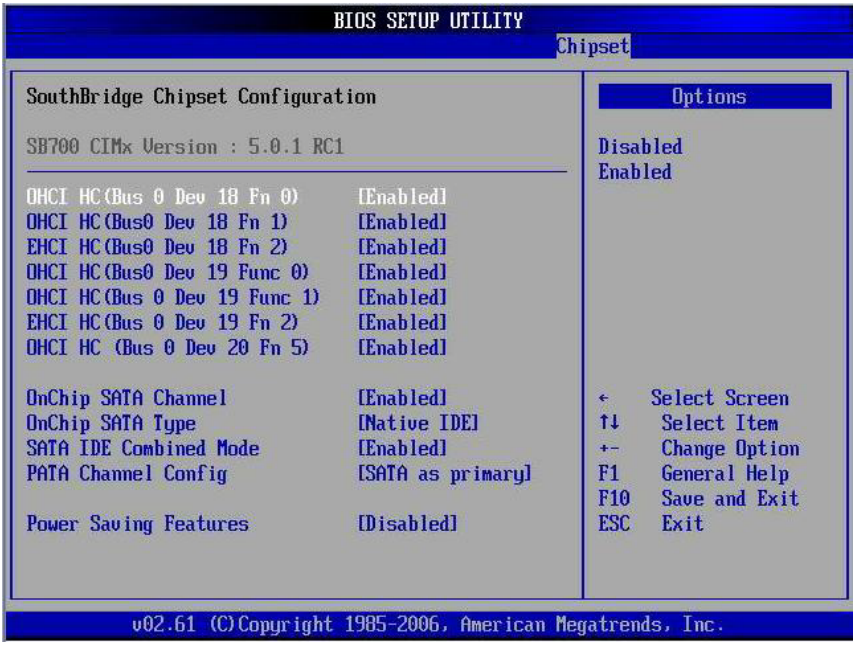
Set the level of ECC protection.

3.7.1.3 DRAM Timing Configuration



Set Memory Clock Mode and Dram Timing Mode.

3.7.2 South Bridge Configuration


BIOS SETUP UTILITY
Chipset
SouthBridge Chipset Configuration
SB700 CIMx Version : 5.0.1 RC1
OHCI HC(Bus 0 Dev 18 Fn 0) [Enabled]
OHCI HC(Bus0 Dev 18 Fn 1) [Enabled]
EHCI HC(Bus0 Dev 18 Fn 2) [Enabled]
OHCI HC(Bus0 Dev 19 Func 0) [Enabled]
OHCI HC(Bus 0 Dev 19 Func 1) [Enabled]
EHCI HC(Bus 0 Dev 19 Fn 2) [Enabled]
OHCI HC (Bus 0 Dev 20 Fn 5) [Enabled]
OnChip SATA Channel [Enabled]
OnChip SATA Type [Native IDE]
SATA IDE Combined Mode [Enabled]
PATA Channel Config [SATA as primary]
Power Saving Features [Disabled]
Options
Disabled
Enabled
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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OnChip SATA Type

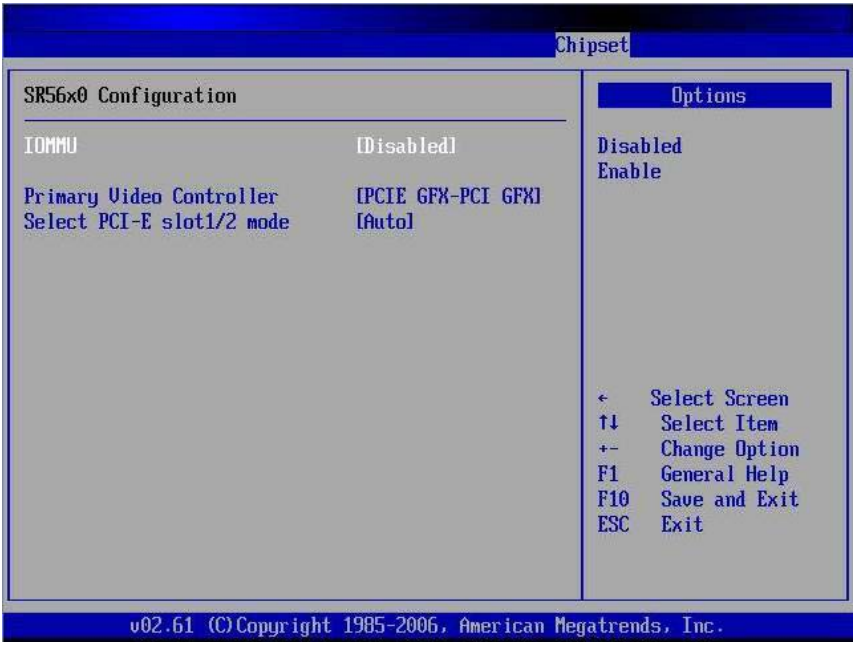
Native IDE: Use IO address assigned by PCI base register as IDE port;
RAID;
AHCI;
Legacy IDE: Use legacy IDE control port.

Power Saving Features

Disable or Enable power saving features in SB. As general rule, this feature should be disabled for desktop and enabled for mobile. See AMD SB700 Power Saving document for more details.

Disabled / Enabled

3.7.3 SR56x0 Configuration



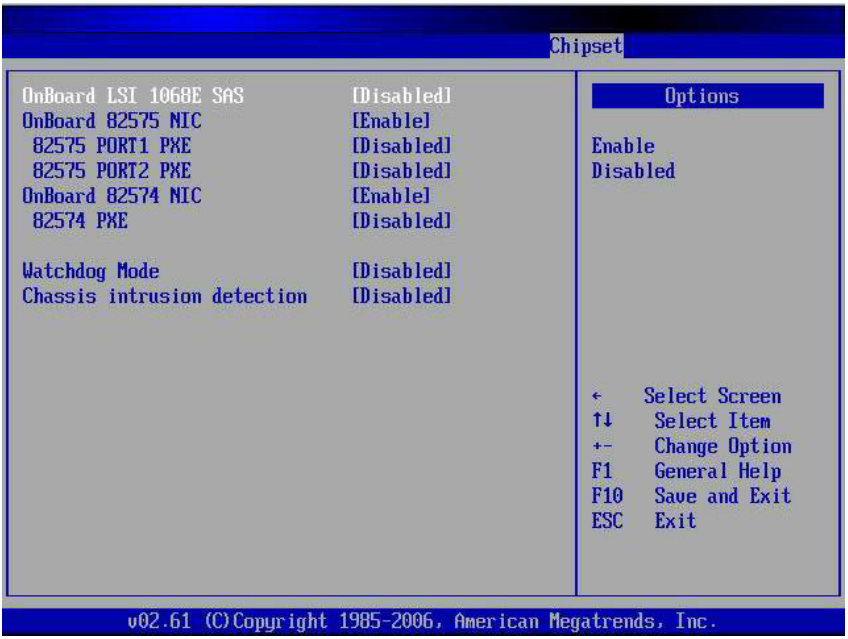
IOMMU
Disable or Enable IOMMU function.
Disabled / Enable

Primary Video Controller
PCIE GFX-PCI GFX: Video card scan from PCIE bus to PCI bus.
PCI GFX-PCI GFX: Video card scan from PCI bus (onboard VGA) to PCIE bus.

Select PCI-E slot1/2 mode
Auto: Auto detect by BIOS.
1X16: Slot1 – X16; Slot2 – not work
2X8: Slot1 – X8; Slot2 – X8.

3.7.4 Onboard Peripherals Configuration

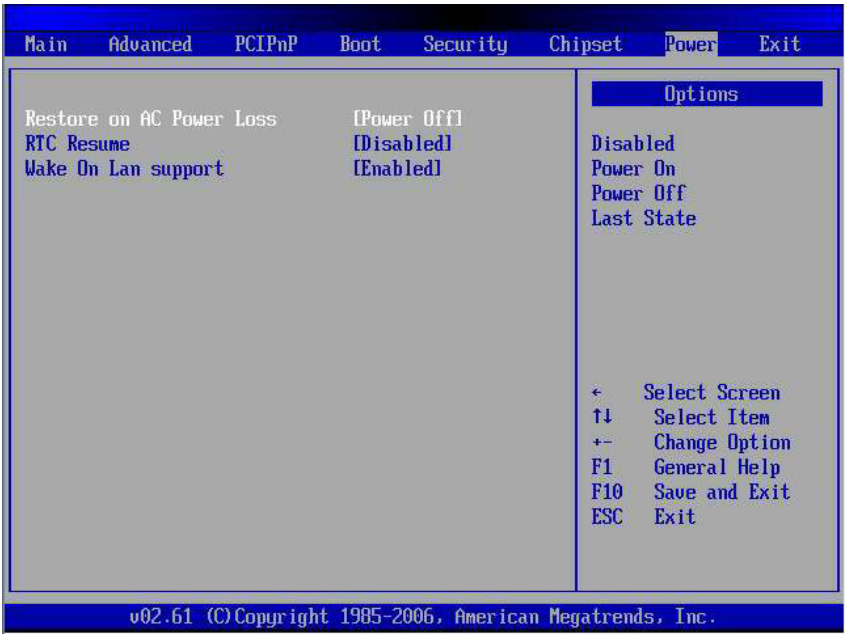
Use this section to enable or disable onboard devices.



Watchdog Mode
Disabled: Disable Watchdog;
POST: BIOS POST Watchdog, timer counting starts at PowerOn, stops at OS boot;
OS: Boot watchdog, starts at OS boot;
PowerOn: Start at PowerOn.

Chassis intrusion detection
Disabled: Disable Chassis intrusion detection;
Enabled: When a chassis open event is detected, the BIOS will record the event and issue a warning beep.

3.8 Power Menu

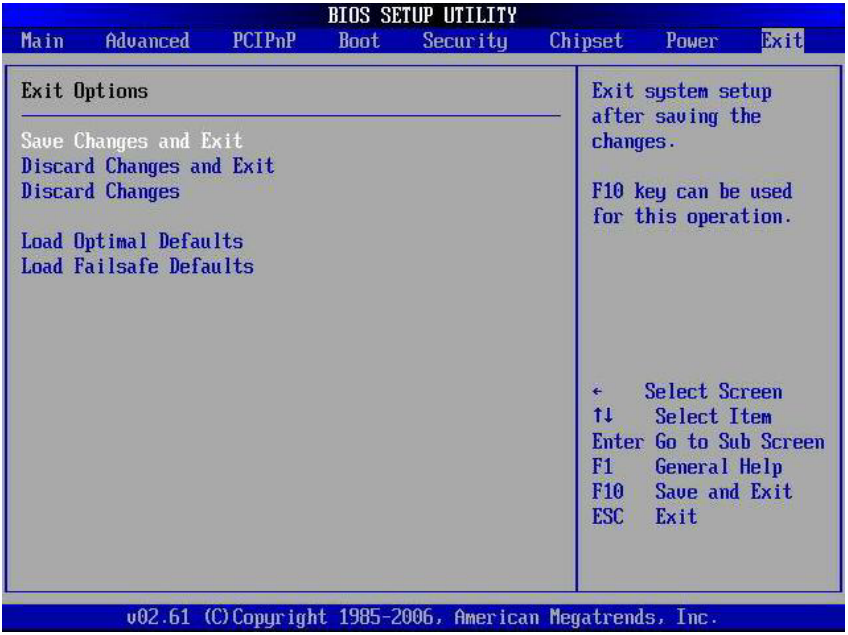


Restore on AC Power Loss
Disabled / Power On / **Power Off** / Last State

RTC Resume
Disable / Enable RTC to generate a wake event.
Disabled / Enabled

Wake On Lan support
Enable or Disable Wke On Lan Function in non-ACPI OS.
Disabled / **Enabled**

3.9 Exit Menu


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Power Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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Save Changes and Exit
Exit system setup after saving the changes.
F10 key can be used for this operation.

Discard Changes and Exit
Exit system setup without saving any changes.
ESC key can be used for this operation.

Discard Changes
Discards changes done so far to any of the setup questions.
F7 key could be used for this operation.

Load Optimal Defaults
Use this option to load default performance setup values.
F9 key can be used for this operation.

Load Failsafe Defaults
Use this option to load all default failsafe setup values.
F8 key can be used for this operation.

Chapter 4: Diagnostics

NOTE: if you experience problems with setting up your system, always check the following things in the following order:

Memory, Video, CPU

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the TYAN® website at http://www.tyan.com.

4.1 Beep Codes

Fatal errors, which halt the boot process, are communicated through two kinds of audible beeps.

- Eight short beeps: It indicates that a video error has occurred.
- A single long beep repeatedly: It indicates that a DRAM error has occurred.

The most common type of error is a memory error.

Before contacting your vendor or TYAN® Technical Support, be sure that you note as much as you can about the beep code length and order that you experience. Also, be ready with information regarding add-in cards, drives and O/S to speed the support process and come to a quicker solution.

4.2 Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, please check the TYAN® web site at http://www.tyan.com

NOTE: Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN® does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN® be held responsible for damages done by the end user.

4.3 AMIBIOS Post Code

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS:

Checkpoint	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable "wCMOSFlags."
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer. Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to "POSTINT1ChHandlerBlock."
08	Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5.
0A	Initializes the 8042 compatible Key Board Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules.
30	Initialize System Management Interrupt.
2A	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initializes the silent boot module. Set the window for displaying text information.

37	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.
38	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system.
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, … etc.) successfully installed in the system and update the BDA, EBDA…etc.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Initializes NUM-LOCK status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested.
8C	Late POST initialization of chipset registers.
8E	Program the peripheral parameters. Enable/Disable NMI as selected
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A8	Prepare CPU for OS boot including final MTRR values.
A9	Wait for user input at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. Deinitializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Passes control to OS Loader (typically INT19h).

Glossary

ACPI (Advanced Configuration and Power Interface): a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

AGP (Accelerated Graphics Port): a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs only at 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

ATAPI (AT Attachment Packet Interface): also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

ATX: the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

Bandwidth: refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path can carry. Greater bandwidth results in greater speed.

BBS (BIOS Boot Specification): a feature within the BIOS that creates, prioritizes, and maintains a list of all Initial Program Load (IPL) devices, and then stores that list in NVRAM. IPL devices have the ability to load and execute an OS, as well as provide the ability to return to the BIOS if the OS load process fails. At that point, the next IPL device is called upon to attempt loading of the OS.

BIOS (Basic Input/Output System): the program that resides in the ROM chip, which provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

Buffer: a portion of RAM which is used to temporarily store data; usually from an application though it is also used when printing and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it to a disk drive. While this improves system performance (reading to or writing from a disk drive a single time is much faster than doing so repeatedly) there is the possibility of

losing your data should the system crash. Information in a buffer is temporarily stored, not permanently saved.

Bus: a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

Bus mastering: allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

Cache: a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times since the information is stored in SRAM instead of slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

Closed and open jumpers: jumpers and jumper pins are active when they are "on" or "closed", and inactive when they are "off" or "open".

CMOS (Complementary Metal-Oxide Semiconductors): chips that hold the basic startup information for the BIOS.

COM port: another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

DDR (Double Data Rate): a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

DIMM (Dual In-line Memory Module): faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

DIMM bank: sometimes called DIMM socket because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

DMA (Direct Memory Access): channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

DRAM (Dynamic RAM): widely available, very affordable form of RAM which looses data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

ECC (Error Correction Code or Error Checking and Correcting): allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they're found.

EEPROM (Electrically Erasable Programmable ROM): also called Flash BIOS, it is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip. TYAN®'s BIOS updates can be found at http://**www.tyan.com**

ESCD (Extended System Configuration Data): a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

Firmware: low-level software that controls the system hardware.

Form factor: an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX.

Global timer: onboard hardware timer, such as the Real-Time Clock (RTC).

HDD: stands for Hard Disk Drive, a type of fixed drive.

H-SYNC: controls the horizontal synchronization/properties of the monitor.

HyperTransport™: a high speed, low latency, scalable point-to-point link for interconnecting ICs on boards. It can be significantly faster than a PCI bus for an equivalent number of pins. It provides the bandwidth and flexibility critical for today's networking and computing platforms while retaining the fundamental programming model of PCI.

IC (Integrated Circuit): the formal name for the computer chip.

IDE (Integrated Device/Drive Electronics): a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

IDE INT (IDE Interrupt): Hardware interrupt signal that goes to the IDE.

I/O (Input/Output): the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

IRQ (Interrupt Request): an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

Latency: the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

NVRAM: ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

Parallel port: transmits the bits of a byte on eight different wires at the same time.

PCI (Peripheral Component Interconnect): a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

PCI PIO (PCI Programmable Input/Output) modes: the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.

PCI-to-PCI Bridge: allows you to connect multiple PCI devices onto one PCI slot.

Pipeline burst SRAM: a fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

PnP (Plug-n-Play): a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

PXE (Preboot Execution Environment): one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was

designed to define a standard set of preboot protocol services within a client with the goal of allowing networked-based booting to boot using industry standard protocols.

RAID (Redundant Array of Independent Disks): a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

RAIDIOS: RAID I/O Steering (Intel)

RAM (Random Access Memory): technically refers to a type of memory where any byte can be accessed without touching the adjacent data and is often referred to the system's main memory. This memory is available to any program running on the computer.

ROM (Read-Only Memory): a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

SDRAM (Synchronous Dynamic RAM): called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

Serial port: called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

SCSI Interrupt Steering Logic (SISL): Architecture that allows a RAID controller, such as AcceleRAID 150, 200 or 250, to implement RAID on a system board-embedded SCSI bus or a set of SCSI busses. SISL: SCSI Interrupt Steering Logic (LSI) (only on LSI SCSI boards)

Sleep/Suspend mode: in this mode, all devices except the CPU shut down.

SDRAM (Static RAM): unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

SLI (Scalable Link Interface): NVIDIA SLI technology links two graphics cards together to provide scalability and increased performance. NVIDIA SLI takes

advantage of the increased bandwidth of the PCI Express bus architecture, and features hardware and software innovations within NVIDIA GPUs (graphics processing units) and NVIDIA MCPs (media and communications processors). Depending on the application, NVIDIA SLI can deliver as much as two times the performance of a single GPU configuration.

Standby mode: in this mode, the video and hard drives shut down; all other devices continue to operate normally.

UltraDMA-33/66/100: a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without a proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

USB (Universal Serial Bus): a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

VGA (Video Graphics Array): the PC video display standard

V-SYNC: controls the vertical scanning properties of the monitor.

ZCR (Zero Channel RAID): PCI card that allows a RAID card to use the onboard SCSI chip, thus lowering cost of RAID solution

ZIF Socket (Zero Insertion Force socket): these sockets make it possible to insert CPUs without damaging the sensitive CPU pins. The CPU is lightly placed in an open ZIF socket, and a lever is pulled down. This shifts the processor over and down, guiding it into the board and locking it into place.

Technical Support

If a problem arises with your system, you should first turn to your dealer for direct support. Your system has most likely been configured or designed by them and they should have the best idea of what hardware and software your system contains. Hence, they should be of the most assistance for you. Furthermore, if you purchased your system from a dealer near you, take the system to them directly to have it serviced instead of attempting to do so yourself (which can have expensive consequences).

If these options are not available for you then TYAN Computer Corporation can help. Besides designing innovative and quality products for over a decade, Tyan has continuously offered customers service beyond their expectations. TYAN's website (**www.tyan.com**) provides easy-to-access resources such as in-depth Linux Online Support sections with downloadable Linux drivers and comprehensive compatibility reports for chassis, memory and much more. With all these convenient resources just a few keystrokes away, users can easily find the latest software and operating system components to keep their systems running as powerful and productive as possible. TYAN also ranks high for its commitment to fast and friendly customer support through email. By offering plenty of options for users, TYAN serves multiple market segments with the industry's most competitive services to support them.

"TYAN's tech support is some of the most impressive we've seen, with great response time and exceptional organization in general" - Anandtech.com

You can contact TYAN Technical Support by using our Online Support System:

http://12.230.196.231/helpstar/hsPages/login.aspx?ReturnUrl=%2fhelpstar%2fhsPages%2fDefault.aspx

Help Resources:

1. See the beep codes section of this manual.
2. See the TYAN website for FAQ's, bulletins, driver updates, and other information: **http://www.tyan.com**
3. Contact your dealer for help BEFORE calling TYAN.
4. Check the TYAN user group: **alt.comp.periphs.mainboard.TYAN**

Returning Merchandise for Service

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not cover damages incurred during shipping or

failure due to the alteration, misuse, abuse, or improper maintenance of products.

NOTE: A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain service by calling the manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid. TYAN will pay to have the board shipped back to you.

Notice for the USA
Compliance Information Statement (Declaration of Conformity Procedure) DoC
FCC Part 15: This device complies with part 15 of the FCC Rules

Operation is subject to the following conditions:

This device may not cause harmful interference, and this device must accept any interference received including interference that may cause undesired operation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:
Reorient or relocate the receiving antenna.
Increase the separation between the equipment and the receiver.
Plug the equipment into an outlet on a circuit different from that of the receiver.
Consult the dealer on an experienced radio/television technician for help.

Notice for Canada

This apparatus complies with the Class B limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations. (Cet appareil est conforme aux norms de Classe B d'interference radio tel que specifie par le Ministere Canadien des Communications dans les reglements d'ineteference radio.)

CAUTION: Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by manufacturer. Dispose of used battery according to manufacturer instructions and in accordance with your local regulations.

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